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ABSTRACT

This is the Final report of a 3-year, 3-phase experiment on the Telebook service, which is a system for delivering the recorded voice of Talking Books directly and electronically to the homes of blind and handicapped persons upon their request at any time of the day or night. The purpose of the third phase was to determine the long-term feasibility of Telebook service, with special emphasis on the question of long-term costs, user and institutional acceptability, and technical performance. The service was offered to all qualified readers in Columbus (Franklin County), Ohio, over a period of nine months, from October 1977 to June 1978. A series of technical measurements was performed to determine comparative, quantitative parameters of audio quality for the semi-automatic and automatic Telebook systems used by readers. A list of 24 recommendations from this study are presented for those who might be involved in planning future replications of Telebook. Appendices include (1) descriptions of both automatic and semi-automatic Telebook systems with operating and maintenance instructions; (2) Telebook staff job descriptions; (3) reader's introduction to Telebook operation; (4) reader recruitment letter; (5) Library of Congress reader survey questionnaire; (6) press conference material; (7) Federal Communications Commission order regarding frequency constraints for cable television systems (excerpt); and (8) agreement in principle between Columbus cable corporations and The MITRE Corporation. (Author/CMV)

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M78-77

# THE COLUMBUS, OHIO EXPERIMENT WITH ADVANCED TELEBOOK SYSTEMS

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By

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June 1978

Prepared for the Library of Congress
under contract number A-75-101

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# ABSTRACT

This final report describes an experimental Telebook service implemented by the Metrek Division of The MITRE Corporation under Contract A75-101 to the Library of Congress. Telebook is a system for delivering the recorded voice of Talking Books directly and electronically to the homes of blind and handicapped people, upon their individual request any time of the day or night. The report describes this new method of providing the recreational reading for such handicapped people, and compares Telebook with conventional mail-to-the-home Talking Book service. The purpose of the experiment was to determine the long-term feasibility of Telebook service, with special emphasis on the questions of long term cost, user and institutional acceptability, and technical performance. The service was offered to all qualified readers in Columbus (Franklin County), Ohio over a period of nine months, from October 1977 to June 1978.

# ACKNOWLEDGEMENTS

Implementing the Telebook experiment in any meaningful way would have been impossible without the wholehearted effort of many persons and organizations. The budget was limited. The plans, ambitious. A number of individuals and firms served far beyond a modest recompense, in amount and quality of their performance. Following are the people and organizations to whom I feel personally indebted through this project.

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## 1.0 INTRODUCTION

This is the final report for the third phase of a three phase experiment, performed under Contract A 73-101 from the Library of Congress, by the Metrek Division of The MITRE Corporation. The purpose of this experiment was to determine the long-term feasibility of widely available Telebook service, with special emphasis on the questions of long-term cost, user and institutional acceptability, and technical performance.

Telebook is a system concept for delivering the recorded spoken information in Talking Books electronically--directly to the homes of blind and handicapped people--upon individual demand, any time of the day or night. This new method of providing the recreational reading for such handicapped people is being compared with conventional Talking Book (mailed-to-the-home) service, by evaluating the results of offering Telebook to qualified readers in Franklin County (Columbus) Ohio. The experimental service was provided over a period of approximately nine months, from October 1977 to June 1978.

The entire three phase contract was performed over a three year period, starting in July 1975. During Phase I, a smaller pilot Telebook system was designed, installed, and tested with readers in the Washington, D.C. area, with approximately 70 readers. The results of this test were encouraging,[1] leading to a Phase II design of three larger, more sophisticated and labor-saving Telebook systems.[2] The most advanced two of these were implemented in Phase III, a large semi-automatic system, and a small automatic system designed primarily for small cities. Both utilized FM broadcast of cassette-recorded material over the cable television systems of Columbus, Ohio, and used the same, specially modified, inexpensive home radios.

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[1] For details, see MTR-7121, "Telebook Center for the Blind, Phase I, Final Report," by K. J. Stetten, January 1976.

The Phase III experiment design decisions were made on the basis of providing a statistically significant large enough sample of readers; a large enough peak labor demand on the Telebook operators; good quality services from an equipment, staffing and book availability standpoint); and the lowest possible experimental cost. The experiment was to be conducted over a period long enough to overcome any apparent novelty effects.

The services and cooperation of many institutions and individuals were required to perform a successful experiment--many of them without compensation. Our deep appreciation to them is acknowledged in this Introduction, and also detailed elsewhere in this report.

Funding for the entire three-year program, provided by the Library of Congress, approximated $300,000, of which, about $90,000 was spent on equipment, and another $37,000 on services (e.g., telephone lines and operator salaries). The MITRE Principal Investigator was Kenneth J. Stetten; and the LoC Project Coordinator was Richard Evensen, of the Division of the Blind and Physically Handicapped,[7] headed by Frank Kurt Cylke. It is commonly said that good architecture requires both a competent architect and a competent client. This program was certainly blessed with the latter. Much crucial guidance and discussion were proffered without undue interference, and our thanks are in order.

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[2] For details, see M76-93, "Report and Proposal to the Library of Congress Regarding a Medium Scale Trial of Advanced Telebook Systems," by K. J. Stetten, December 1976.

The scope of this report is given in RFQ-93,[8] page 33: "...a final report which will primarily collect the system operation procedures, and give recommendations for any future implementations. In particular, the report will compare the different (automatic and semi-automatic) approaches to equipping Talkback centers--and recommend where, and in what form, and under what circumstances each may have its greatest utility. The present long-term Talkback cost projections will be amended, if necessary, based on the actual operating experience for each of the three (later changed to two) systems."

Since the Library of Congress will later be preparing an independent report detailing an evaluation of the experiment, it is important to state what subject areas will not be covered in this report. This report will not draw conclusions on the overall utility, desirability, or even feasibility of Talkback being implemented as a standard program of the Library of Congress. The raw data collected during the experiment on the readers' utilization of the system; their reading habits both before and during the experiment; and their answers to the postal service attitudinal survey administered by telephone have been forwarded to NLS for their analysis, collation, and correlation and later publication. But some sample reader data pertinent to amending the long-range cost forecasting will be presented herein, as well as the derived-cost comparisons. This report will not draw conclusions as to the Talkback readers attitude to Talkback service, but we do publish the reader survey questionnaire (Appendix VI) with total responses to each of the multiple choice answers). Also not covered in this report is the official stance of the three GTE companies running the three systems in Columbus and Franklin County (and a fourth soon to start operating) toward continuing to provide them, and/or elsewhere, their free or very low cost services necessary for economically viable Talkback operation.

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[7] Now called National Library Service for the Blind and Physically Handicapped.

[8] Ibid. Also in more abbreviated form, in the Work Statement, page 33.

The flavor and emphasis of this report then is more a handbook and reference document for those justifying any further applications of Talkback, or systems similar in form or application. The body of this report starts with a description of the Talkback hardware and its configuration in Columbus; proceeds to a description of operating procedures and organizational interfaces (written by William Williams, local Talkback Supervisor), based on the Columbus experience; then gives the results of a series of comparative, quantitative technical measurements on Talkback systems as well as conventional Talking Book audio quality; summarizes our recommendations for changes or improvement in future implementation of Talkback systems; and finally, derives modified long-term operating cost projections of Talkback systems, comparing them to the conventional method of delivering Talking Books.

## 2.0 TELEBOOK SYSTEM CONFIGURATION IN COLUMBUS, OHIO

### 2.1 Telecommunications

The franchise to provide cable television service in Franklin County, Ohio is unusual in that four different companies have received such an award--in mutually exclusive geographical areas. One of the four is only now beginning service (KBLE, Inc.), largely in the inner city, and was not available to participate in the Telebook experiment. The Franklin County map shown in Figure 1 indicates the boundaries of the service areas of each company, the location of their headend(s), the location of the Telebook Center at the Main Library of the Public Library of Columbus and Franklin County, and storage depots for spare Telebook radio receivers at fire stations in Columbus.

The benefit of having diverse cable companies serving the Telebook readers for an experiment is obtaining a more balanced experience and reaction of various managements, with differing technical plants. It does mean more work. Referring to Figure 2, the overall configuration of Telebook communication to tie together the five (Coaxial Communications had three) headends involved can be seen. Although the thirty-six telephone lines indicated were originally used during the first two months of operation (20, 10, and 6 respectively to Warner, All American and Coaxial), these were later reduced to 20 (9, 6, and 5 respectively and even later to only 16 (9, 3 and 4 respectively) when the total number of active Talking Book readers in Franklin County, reached by cable companies, proved far less than anticipated.

The telephone lines are dedicated, unswitched, and the least expensive (lowest fidelity) available). They are designated Class III, dry lines; are typically used for periodic live radio broadcasts from churches and sports arenas; and cost approximately $20 to $40 per month each, depending on the length of run. The signals fed into the phone lines were a nominal 1 volt, from a balanced 600 ohm audio transformer.

### 2.2 Semi-automatic System

Two photographs of the Hansonic semi-automatic console are shown in Figure 3. This system served the majority of readers--approximately 170 people out of 190 total, and was staffed around-the-clock from November 1977 to June 1978. This system is almost identical to that proposed in M76-93, which also states the rationale for its design. The semi-automatic rack had physical space for 60 cassette tape players; forty of them wired; and ultimately 20 used. The system provides automatic four-track head sequencing and tape direction reversal, for a total unattended playing time of six hours per cassette, at the special Library of Congress cassette speed of 15/16 inches per second.

Other features of this system are the automatic stopping of station finding music when the operator inserts the cassette; automatic power cutoff at the end of the fourth track playing; lighted indicators of which track is playing on each player; and provision for aurally and visually monitoring volume and audio quality. This system performed uninterruptedly for nine months with only one-half hour of downtime for repair--to replace a fuse. More data on operation, construction, maintenance procedures, etc. are given in Appendix I.

A subsidiary device for the semi-automatic system is the tape "logger." This machine was designed to save operator time in rewinding cassettes partially read, and later fast forward winding to restore the exact position, to serve readers as they resume reading where they left off. All these operations take place at high speed, about 100 inches per second. This machine is shown in the photograph in Figure 4. The two loggers were developed especially for this experiment to maximize operator efficiency, especially during peak reading hours.

These logging machines did not work reliably, even after many attempted adjustments. Their problem evidently is the unexpected varieties (colors) of translucent plastic leader at the end of Library of Congress cassette tapes. The logger depends on photo-sensing light passed through the leader to determine that it is time to brake the motion of the tape. The manufacturer was given only a copy of Roots as a sample. It happens that there are at least two other different, less transparent leaders used in production, and setting the sensitivity for one of them precludes the machine working properly for others. Since too many cassettes are already distributed with non-standardized leader material, a different means of sensing, such as reflective or conductivity markers (which can be added to existing cassette leaders used for Telebook and routinely used in future production cassettes) is necessary if the problem is to be solved. Fortunately, the deficiency of the loggers did not inhibit the peak load operators could handle in Columbus. Three copies of most books were available. Usually operators were able to store Mrs. Jones tape at the place she left off until she needed it again. In actuality, having three copies of a book was found necessary only for the most popular books. Two would be adequate otherwise, since readers are commonly reading different cassettes of a multi-cassette book.

### 2.3 FM Modulators

The CATEL FM modulators used at the CATV headends (Figure 5) provided no problems in either installation or maintenance. There was a problem, however, in choosing the exact spectrum frequency of operation, and adjacent Telebook channel spectrum spacing. At the time of the experiment final planning the FCC was in the midst of a rule making relative to restrictions of frequencies allowed for use on CATV that might interfere with aircraft operations, if the CATV system were defective (see Appendix VIII for relevant excerpt of resulting regulation). This uncertainty was greatly compounded by the fact that Warner's QUBE interactive TV system was still in the final design stages (it started service on December 1, 1977), and late in the planning cycle it was learned that Telebook would be left little in the way of frequency access to their system, but bands close to air traffic navigation signals. It also meant that the twenty planned channels on Warner would have to be placed at the minimum frequency spacing theoretically possible. And in addition to this, it was confirmed very late, because of delayed shipment of sample radios from

Hong Kong, that the inexpensive radios could not separate channels at such minimum spacing (200 KHz), because only about one-third of our dial could be used for Telebook on Warner's unusual system.

To make a long story short, the spacing problem was "solved" when it was found that less than half the number of channels (with 400 KHz spacing) would be adequate to serve readers on Warner's cable. And the eventually promulgated FCC rule only demanded a minimum of 100 KHz spacing away from any nearby air navigation channels, which was little hindrance to choosing frequencies, even within the unusual constraints of Warner QUBE. However, these problems caused much additional work, for MITRE, Warner and some of MITRE's subcontractors, as well as delaying service to readers on Warner's cable system.

With regard to the cable systems, no problems were encountered either with equipment, or the performance of their personnel handling duties relative to Telebook hardware--once common ground was made as to method and technology.

### 2.4 Home Receivers

The radios purchased for Telebook had to be very inexpensive, both for experiment budgetary reasons, and also to prove that inexpensive radios[5] could do the job for the long term, if Telebook was widely replicated. The only radio modification from a normal "drugstore $25 AM-FM portable" was the shifting of their tuning range 22 MHz upward to 110 - 130 MHz on the dial, and substituting a cable connector for the existing telescopic antenna (see Figure 6). The difficulty was finding a manufacturer interested in building only 600 prototypes at a cost only slightly higher than normal wholesale...about $15 each; but this was done.

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[5] If a large scale purchase of radios were made in future, we believe the costs of engineering a special radio would be justified. Such a radio could easily incorporate narrow band FM circuitry, similar or the same as public service (e.g., police) radio receivers. This feature would greatly add to long-term acceptance by CATV management by reducing to one-tenth the cable spectrum allocation required for Telebook (i.e., less than 1 MHz total per city).

A major design problem on radio delivery arose when Warner Cable became concerned about the possible deleterious effects of relatively strong radiation (1 millivolt) from the radios with soon-to-be-initiated, spectrally adjacent QUBE services. New modifications to the prototype radios were requested, and new samples submitted to Warner for testing. All this took much time, and delayed shipments. Again, to make a long story short, it was eventually proven to Warner that the radios would not interfere with their customers' reception, and this was to be the case over the entire six months of Warner's participation.

In any future larger-scale replication of Telebook, it should be feasible to more completely redesign radios for such service. To do so, a receiver circuit should be chosen not using a single transistor for both local oscillator and mixer--the so-called autodyne circuit--used in the only useful radio available from the only manufacturer we were eventually forced to rely on by time constraints. Such would allow better control of backward radiation into the cable which then could, and should, be held to below 100 microvolts--even if no adjacent TV service is planned.

Another major problem with the delivered radios was their large number of defective units, or those becoming defective shortly after installation. This was almost certainly due to the hastily made modifications made at the factory as delivery deadlines for the "final" modified radio became evident.

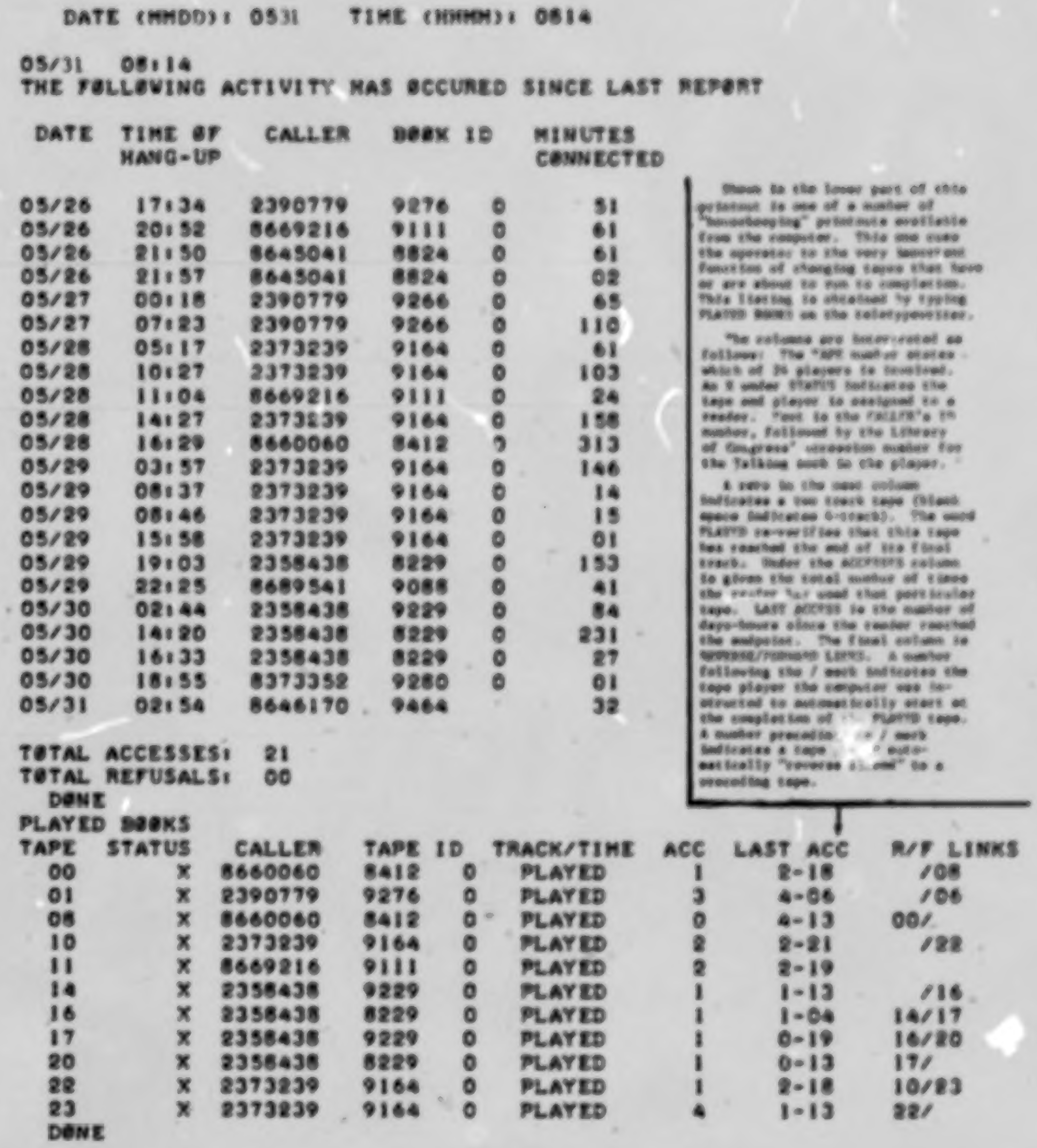
## 2.5 Automatic Telebook System

Small cities, of the order of 100,000 population, would be expected to have perhaps only 100 or so active Talking Book readers. This is an inadequate number to economically justify using full time Telebook operators, and they would not generally be kept busy by the demand of such a small readership. However, a great number of users, collectively, live in such cities. And there are many CATV systems in such cities also. Accordingly, it was decided to test the feasibility of utilizing an automatic system of hardware whereby readers would stop and start their players by remote control in lieu of an operator-staffed center. Such a system was developed by Sudbury Systems, Sudbury, Massachusetts under subcontract to MITRE (see Figure 7), which allowed readers to remotely turn their player off and on by use of Touchtone telephone signals without the presence of any operator, except for a few minutes daily, to change cassettes. Like the semi-automatic system, it also performs track switching, tape motion reversal, and automatic stop. It also provides many other functions necessary to handle reader interaction; e.g., playing special status tapes; handling telephone protocols; and performing all the functions of keeping up to date operator logs in its memory. The entire system is controlled by a specially programmed micro-computer. The system's typewriter input-output channel is fed information about reader's code (telephone) number, book number, tape player number by the use of a Teletype console. This typewriter also serves to print out information on present readers, books in place, and every reader transaction. An example of such a printout is shown in Figure 8.

In the printout illustrated , we see that on June 16, at 15:30, the machine printed a status report, showing that ten calls had been made to the machine in the past approximate 24 hours. The phone number of the callers are given, as is the duration of reading at each connection, and the number of any refusals of service because of all output lines being busy. A much more detailed technical description of the operating features, installation, operating instructions, and interpretation of sample printouts is given in Appendix II.

The automatic system was offered to 19 readers. The system could accommodate a maximum of 24, four at a given moment--i.e., four output channels. The extra cassette players were programmed to provide alternate (or sequential) books to some of the readers; or, using the "linking" feature, have the machine automatically progress to the next tape cassette in a book.

As delivered, the machine had what turned out to be one software error, but a serious one that prevented service from being continued until it was corrected a few weeks later. This error caused the



```
   DATE (MMDD): 0531   TIME (HHMM): 0814

05/31   08:14
THE FØLLØWING ACTIVITY HAS ØCCURED SINCE LAST REPØRT

 DATE   TIME ØF     CALLER     BØØK ID      MINUTES
        HANG-UP                             CØNNECTED

05/26   17:34     2390779     9276    0          51
05/26   20:52     8669216     9111    0          61
05/26   21:50     8645041     8824    0          61
05/26   21:57     8645041     8824    0          02
05/27   00:18     2390779     9266    0          65
05/27   07:23     2390779     9266    0         110
05/28   05:17     2373239     9164    0          61
05/28   10:27     2373239     9164    0         103
05/28   11:04     8669216     9111    0          24
05/28   14:27     2373239     9164    0         158
05/28   16:29     8660060     8412    0         313
05/29   03:57     2373239     9164    0         146
05/29   08:37     2373239     9164    0          14
05/29   08:46     2373239     9164    0          15
05/29   15:58     2373239     9164    0          01
05/29   19:03     2358438     8229    0         153
05/29   22:25     8689541     9088    0          41
05/30   02:44     2358438     9229    0          84
05/30   14:20     2358438     8229    0         231
05/30   16:33     2358438     8229    0          27
05/30   18:55     8373352     9280    0          01
05/31   02:54     8646170     9464               32

TØTAL ACCESSES:   21
TØTAL REFUSALS:   00
  DØNE
PLAYED BØØKS
TAPE   STATUS      CALLER      TAPE ID     TRACK/TIME     ACC    LAST ACC      R/F LINKS
  00          X   8660060     8412    0     PLAYED         1      2-18          /08
  01          X   2390779     9276    0     PLAYED         3      4-06          /06
  08          X   8660060     8412    0     PLAYED         0      4-13        00/
  10          X   2373239     9164    0     PLAYED         2      2-21          /22
  11          X   8669216     9111    0     PLAYED         2      2-19
  14          X   2358438     9229    0     PLAYED         1      1-13          /16
  16          X   2358438     8229    0     PLAYED         1      1-04        14/17
  17          X   2358438     9229    0     PLAYED         1      0-19        16/20
  20          X   2358438     8229    0     PLAYED         1      0-13        17/
  22          X   2373239     9164    0     PLAYED         1      2-18        10/23
  23          X   2373239     9164    0     PLAYED         4      1-13        22/
  DØNE
```

Shown in the lower part of this printout is one of a number of "housekeeping" printouts available from the computer. This one cues the operator to the very important function of changing tapes that have or are about to run to completion. This listing is obtained by typing PLAYED BOOKS on the teletypewriter.

The columns are interpreted as follows: The TAPE number states which of 24 players is involved. An X under STATUS indicates the tape and player is assigned to a reader. Next is the CALLER's ID number, followed by the Library of Congress' accession number for the Talking Book in the player.

A zero in the next column indicates a two track tape (blank space indicates 4-track). The word PLAYED re-verifies that this tape has reached the end of its final track. Under the ACCESSES column is given the total number of times the reader has used that particular tape. LAST ACCESS is the number of days-hours since the reader reached the endpoint. The final column is REVERSE/FORWARD LINKS. A number following the / mark indicates the tape player the computer was instructed to automatically start at the completion of [illegible] PLAYED tape. A number preceding [illegible] / mark indicates a tape [illegible] automatically "reverse linked" to a preceding tape.

FIGURE 8
COMPUTER PRINTOUT FROM AUTOMATIC TELEBOOK SYSTEM

computer to stop (called a "software crash") when a second reader sought service if the system was still in the process of initiating a first caller's station-finding tone. The error was found to have been made, and not detected, by a late change in computer program made after the factory acceptance checkout, just before shipment, to correct a deficiency from requested operating procedure that was discovered at the checkout. Shortly after being restored to service, a severe lightning storm occurred one evening near the location of this system. The next morning the automatic system, and overhead light bulbs, were found inoperative. Two weeks elapsed time of engineering diagnosis, both in Columbus and Sudbury, Massachusetts finally determined that one low cost, solid state component, in the phone line input circuit had become defective. Service was restored quickly after its replacement.

After these two problems were corrected, the system had no further breakdowns or other failures during its service to readers, a period of approximately two months. However, the combination of on-again-off-again service during initial debug, combined with the already late delivery and startup, and soon to come experiment cessation probably discouraged some of the 20 readers volunteering to use the system. The automatic system, in our opinion, has not yet had an adequate period of stable, operational service testing to completely evaluate its full potential. However, the equipment eventually proved reliable. The readers and operators learned to use it without much difficulty. And costs per reader, while significantly higher than the semi-automatic system, can still be competitive with conventional Talking Book delivery methods. The automatic system thus seems suited for small population groups, and the semi-automatic system is most economical for large population groups.

## 2.6 Telebook Library

The Telebook library stacks (see photograph, Figure 9) were installed both in the room containing the semi-automatic console, and overflow in the hallway directly outside. An initial library of close to 600 of the most recent Talking Books grew to approximately 1,000 by the June 1978 end of the experiment. As stated earlier, the library contained three copies of each book on cassette. Disc issues by the Library of Congress were transcribed to cassette by the Division for the Blind and Physically Handicapped especially for this experiment. Organization of the Telebook library is described in part of the next section.

## 2.7 Patron Recruitment

At this point, we should describe the various methods used by the Telebook staff to recruit interested blind and physically handicapped readers in the project. It should be noted at the beginning that none of the methods utilized proved to be entirely successful, for reasons that will become apparent; consequently, our readership never reached the projected number of 600. Since this point is covered later in the long-term cost projection, we will not belabor it here. However, our experience should be thoroughly examined by any future operator of a Telebook program in the hope of finding some more viable method of getting patrons.

At the beginning of the experiment, the Regional Library sent us a list of all Talking Book users in Franklin County, and we mailed each of them both a large-print letter describing Talkbook, and a postcard to return if they were interested. Subsequently, each person who returned a card was contacted by phone in order to ascertain whether he was still interested. We received a flood of post cards, which indicated that many potential readers existed, but the problem most immediately apparent with this approach was that many respondents were not located in an area served by cable. Consequently, these people had to be contacted and informed that they could not be served; it is impossible to determine at this time whether this circumstance damaged the reputation of Talkbook within the blind community, but we seriously doubt that this was the case.

The Regional Library list had other problems as well. One of them was that the library carries readers in its computer for one year, regardless of whether they have cancelled Talking Books or not. Another is that our list contained a large number of institutionalized persons; the problems we encountered concerning institutional placements is covered elsewhere. Also, many people had moved, had their phones disconnected, or changed phone numbers; some were deceased. In short, this method of recruitment proved most unsatisfactory.

Our final round of recruiting worked rather more smoothly; we had a second letter (see Appendix V for both letters) sent from Cleveland to potential patrons requesting that *they* call the CATV company in their area if they were interested. We decided on the basis of the response that this was the most feasible method we had discovered, since responsibility for immediate action in initiating installation is placed on the reader, while he is motivated. With the benefit of hindsight, this is what should have been done with our other publicity coverage - which was of significant dimension. Local TV stations, radio stations, the Central Ohio Radio Reading Service and local newspapers (see Appendix VIII for some examples) all gave good coverage of Telebook. All this coverage should have included a number to call for installation appointment.

### 3.4 Interaction with Cable and Telephone Companies

The costs of Talking Book distribution are in the $50-$100 range per yearly reader, whether delivered by conventional or electronic means. Thus a charge to the Library of Congress of even a fraction of the normal CATV subscription fee (about $8 a month or $96 a year) added to the existing costs of distribution would be prohibitive. Thus an essential economic constraint for Telebook is that no standard cable subscription charges can be assessed by Telebook.

That no more than 0.1% of the population are likely to be Talking Book readers is important to CATV companies, since the number of homes they would be asked to install and provide cable service for is limited. With this understanding, among others, the three cable companies in

Columbus, Ohio,[6] and their corporate owners, agreed to try such a free-of-charge special TV service for what was really a mutual experiment for both them and the Library of Congress.

The full agreement between The MITRE Corporation and the CATV companies is reproduced in Appendix IV. Two of the three firms signed the agreement, and the third informally agreed. Such an agreement was obviously essential, as was the cable companies' later cooperation. In addition to the home installation of cable and wall jack, and service with electronic signals, the companies also had the occasional duties of arranging with the household for entry by their installer, and showing the reader how to use the controls of the special cable. All of this was done very well by the companies, and we wish to express our gratitude to them.

Based on informal information from the cable firms, it seems there was never a case of Telebook signals interfering with the cable's commercial services, and very few cases of readers bothering the companies with complaints or trouble calls--instead of calling the Telebook operators, who then contacted the Telephone Pioneers to rectify such troubles. It is hoped therefore that the corporate owners of these and other cable companies, (called in the industry MSO's), for multi-system owners) would respond favorably to requests for future service under similar agreements not only in Columbus, but elsewhere.

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[6] The three CATV firms in Columbus, Ohio are Warner QUBE, [illegible] American Cablevision Co. and Coaxial Communications of Columbus, Inc. Between them, about 75 percent of the approximately one million Columbus, Ohio population has the opportunity of subscribing to cable television. A fourth firm, [illegible], will soon be starting service, largely in the presently unserved inner city.

From the standpoint of the municipally regulated CATV companies, it has been an opportunity to provide a major public service, at extremely low long-term cost to them, by utilizing a very small portion of (currently unused) spectrum space. Official reactions from these (MSO) corporations will be sought by the Library of Congress.

The foregoing is not to say there were no problems for and with the cable companies, or important lessons learned during the experiment. The largest problem was caused by a singular and unusual event involving the Warner Cable Company of Columbus. A multi-million dollar effort by Warner to first install and develop a very elaborate, two-way interactive, home-to-computer-controlled service was being finalized and targeted for initial service at the same time as was Telebook. This service is called QUBE, and it has received national publicity.

As already detailed in this report in the sections, 2.3 and 2.4, describing home receivers and FM modulators, the uncertainties caused by the fluke of this simultaneous development; plus Warner's staff expansion and changes that accompanied the new service, caused many delays to the initiation of Telebook, well beyond that implied to our readers. In the future we recommend that Telebook installation not become involved in such ongoing developments of others.

A few other problems with the cable companies having much less impact on the experiment but well worth avoiding should be listed. It was found difficult and laborious for cable company personnel to reach by phone all those readers who indicated by return postcard that they wanted service. A much easier way was found in a second recruitment effort. Potential readers simply call the cable company firm directly to arrange a date for installation, just as would ordinary subscribers to the cable. However, since Telebook installation is free, it is necessary to provide the cable operator the complete reader mailing list, for checkoff purposes, to protect the company against possible attempts by unqualified persons to cheat the firm of a free hookup asking for such service.

On the same subject it is worthwhile explaining beforehand to the installation crew that all readers are not completely blind, and those having such partial sight are not cheating the cable company. However, to keep perspective we want to state that the installers performed admirably from both the standpoint of the readers and the Telebook operators. They were efficient, courteous, and thorough.

The Ohio Bell Telephone Company had the best of intentions relative to supporting Telebook, and eventually delivered everything that was requested. Perhaps our need for special dedicated lines to five different locations was unusual. To make a long story short, it took a great deal of management effort to obtain the correct quantity of properly working lines to the proper locations, and to then be properly billed for them. Some of these billing problems are still not fully resolved at this writing. It is the writer's feeling that the degree of such problems experienced with Columbus installations of special phone service are not necessarily to be expected everywhere else in the United States.

It may be possible in the future for Telebook to be provided in the home independent of the cable, by what might be thought of as a technical elaboration of the subcarrier broadcasts used for example by the various radio reading services for the blind in many metropolitan areas. In such systems, a small, easily moveable radio with conventional whip antenna can be used anywhere in the home, and almost anywhere in the metropolitan area. For Telebook, a special circuit would allow it to tune to any of 10 - 20 channels, to receive an individually requested book, just as with the cable version of Telebook. But in this case there would be no cable connection.

This is done by a special modification of the subcarrier technology, which allows the 10 - 20 additional audio signals to "piggyback" on a single FM broadcast signal. This system would take advantage of the narrow 3 KHz bandwidth of Telebook, as opposed to the 15 KHz requirements of high fidelity audio signals, such as used in the radio reading services. The net result is a 10 - 20 time multiplication of channels obtained on conventional subcarrier systems. Although this explanation is greatly oversimplified, experiments performed by a Telebook consultant, Ted Hartson, on his proprietary invention to do this, called Spectraplex, appear promising based on tests with his low powered commercial FM transmitter. A full scale test with a licensed commercial FM transmitter would require outside funds to properly test the concept.

## 3.0 OPERATING PROCEDURES (BY WILLIAM MCELHANEY, COLUMBUS TELEBOOK SUPERVISOR)

### 3.1 Preface

This section of the Telebook report is a manual for operation of any future Telebook center. It is based upon the assumption that the equipment and functions will be at least similar, if not exactly the same as that used in the Columbus, Ohio phase of the experiment. All mechanical operations will be outlined, and procedures such as staffing and training of operators are believed readily adaptable to local conditions. While some of our operations were simplified because of our location in the main branch of the Public Library of Columbus and Franklin County, and because of our relatively close proximity to a regional library, it is reasonable to assert that a Telebook Center which lacks these resources will still be viable; the managers will simply have to devise alternative methods and procedures.

Some of our most important contacts, such as the Telephone Pioneers of America, have chapters in every city of any size, and Radio Reading Services are multiplying at an increasingly rapid rate. We found close cooperation with the Radio Reading Service of Central Ohio to be invaluable, but the creation of a network of Telebook Centers is certainly not dependent upon the immediate proximity of a reading service. It will, of course, be absolutely necessary for any new Telebook operation to maintain a close working relationship with the regional purveyor of Talking Books; this fact will become evident in the remarks below. This report, then, both outlines what we did in Columbus, Ohio, and may serve as a guideline as to how another Telebook program may be established in the future. Hopefully, the inauguration of Telebook as an alternative to the present means of delivering Talking Books to the blind and physically handicapped is not far in the future.

### 3.2 Staffing

The job descriptions for both supervisor and operators, as written by The MITRE Corporation, are published in Appendix III of this report. In Columbus, it was determined that these descriptions establish accurate and realistic guidelines for the selection of the personnel. The most necessary quality for all Telebook staff is, not surprisingly, an orientation toward public service, and the Columbus experience was fortunate in this respect. We were singularly lucky in that we were able to assemble such a staff with comparative ease. Our primary source for selection of prospective personnel was the non-professional applications file of the Public Library of Columbus and Franklin County. Interview appointments were arranged by the secretary to the Personnel Director, and we hired most of our original staff using this source and method. Illness and accidents (none of them job-related) accounted for some turnover in our staff, and the second source to which we turned to fill vacancies was the Student Employment Office at The Ohio State University. This source proved quite satisfactory with one major exception; the obvious drawback in using college student personnel is that they are generally unavailable for work between 8:00 A.M. and 4:00 P.M.; this shift had to handle one entire peak reading period and part of another, so it is virtually impossible to employ students between these hours. On the other hand, college students are ideal for evening and weekend work, particularly since they can study during slack reading periods. The shift from 12 midnight to 8:00 A.M. is out of the question for student personnel, at least during the week, but students found these hours quite satisfactory on weekends.

At the outset of the Columbus experiment, we decided to use what were, in effect, two separate staffs, one for Monday - Saturday from 8:00 A.M. to 8 A.M., and one from Saturday to Monday, 8:00 A.M. to 8:00 A.M. These hours were decided because our original midnight to 8:00 A.M. person for weekends was a student, and we wished to give him one free weekend evening. At any rate, employees worked eight-hour shifts, so the weekend people were essentially part-time and the positions were advertised as such. However, hours were not rigid in that each staff member was asked to indicate whether he would be able to work some shift other than his own, at least occasionally, and most were willing to do so. Each operator was given the phone numbers of those persons who could serve as his alternates, and all were encouraged to attempt to find another operator as a backup in case of emergency before contacting the supervisor. Time sheets were scrupulously kept, so that the supervisor would know who had worked at which hours; if an operator had to call a replacement, the reason had to be indicated on the time sheet. Of course, the supervisor served as ultimate backup operator, and so was in effect on 24-hour call. Once established, the system outlined above worked admirably; toward the middle of May, in fact, two college students were splitting the entire weekend between themselves, and did so quite conscientiously.

At the outset, two operators were assigned to each shift; however, after our official opening on December 1, 1977, we cut back to one operator per shift, since the readership had not reached the expected level and one person could cover the time period adequately. Obviously, this reduction necessitated even closer communication between the operators, and they responded well. I might add that in May 1978, the average age of our five-member staff was 23.8 years; of these people, two were full-time college students and three were planning to return for degrees but were working for the time.

It is not at all necessary for operators to have much knowledge of standard library procedure, but the supervisor should be able to train them in elementary readers' services, since they will frequently be required to help patrons to select books. Knowledge of the subject catalog's contents and use are readily acquired, and some feeling for probable reader preferences comes quite rapidly with practice and guidance. All of our operators became proficient in this area, and the readers were both patient with the process and delighted with the results.

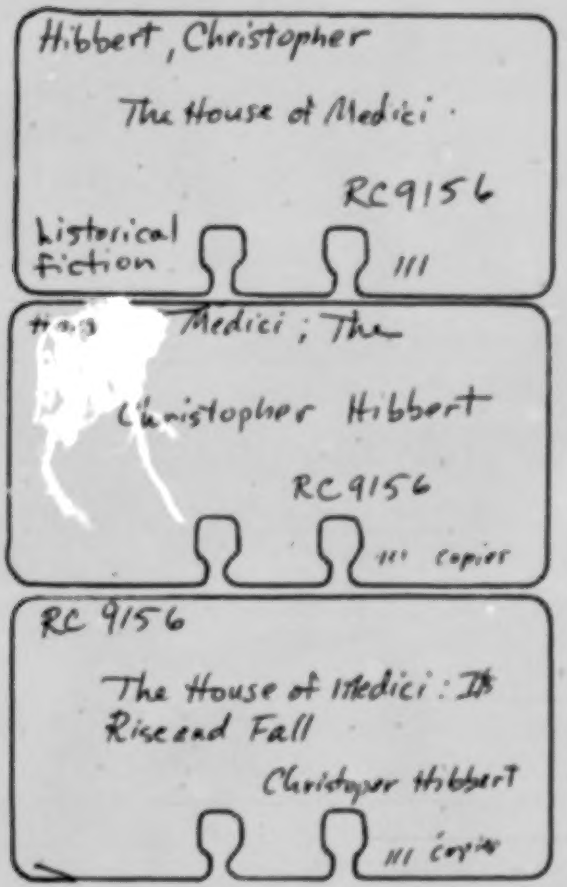
### 3.3 Shelving and Cataloging

We shelved our books in strict numerical order; since all of our stock was on cassette, we could ignore the RD and RC designations that would otherwise have separated our collection into discs and tapes. The books were catalogued by author, title, number and subject (see

Figure 10) and the subject catalog was primarily used as a tool for reader's services. Small Rolodexes (see Figure 3 ) were used for the author, title, and number catalogs. Each card also carried a cross index to the section of the subject catalog section where the description of the book was filed. The titles of these sections were taken from the Talking Book Topics annual catalog, and the subject catalog was further divided into sections for childrens' and adult books. Adolescent materials were filed with the adult books, and extra subject cards were created when we felt that a book might fit into more than one category, e.g. history and sociology. As stated above, all staff members were required to familiarize themselves with the subject catalog and the method of accessing it from the rolodex cards.

## 3.4 Special Staff Duties

We found that some tasks were most efficiently performed when shared by all the operators, while others were best accomplished when assigned to a person whose talents and temperament were best suited to that job. For instance, while in theory the cataloging of new books was a task to be shared equally by all operators, we found that two of the people wrote in an exceptionally clear hand and it was to the benefit of the entire operation to have the title, author and number catalogs printed as clearly as possible; consequently, the major part of this task was allocated to these operators. The subject catalog, on the other hand, was created by cutting the book descriptions from Talking Book Topics and pasting the cutouts onto blank 4x6 filing



Hibbert, Christopher

The House of Medici ·

RC9156

historical fiction

///

H[illegible] Medici ; The

Christopher Hibbert

RC9156

/// copies

RC 9156

The House of Medici : Its Rise and Fall

Christoper Hibbert

/// copies

**The House of Medici: Its Rise and Fall** 3 copies
by Christopher Hibbert,
narrated by
Alan Haines, 4C. **RC 9156**
Account of the famed Italian family of rulers and patrons of the arts that includes the history of the times and the lives of Cosimo, Lorenzo, the Medici popes, and other figures of the period, 1975.

FIGURE 10
TELEBOOK LIBRARY CATALOG CARDS

cards, and then filing them numerically in the appropriate section of the subject catalog. Because it required no particular talent, making subject cards was a task shared by all the operators. The night operator rarely had enough work to fully occupy him, so shelving new books, as well as any that had not been shelved during the day, was assigned to him.

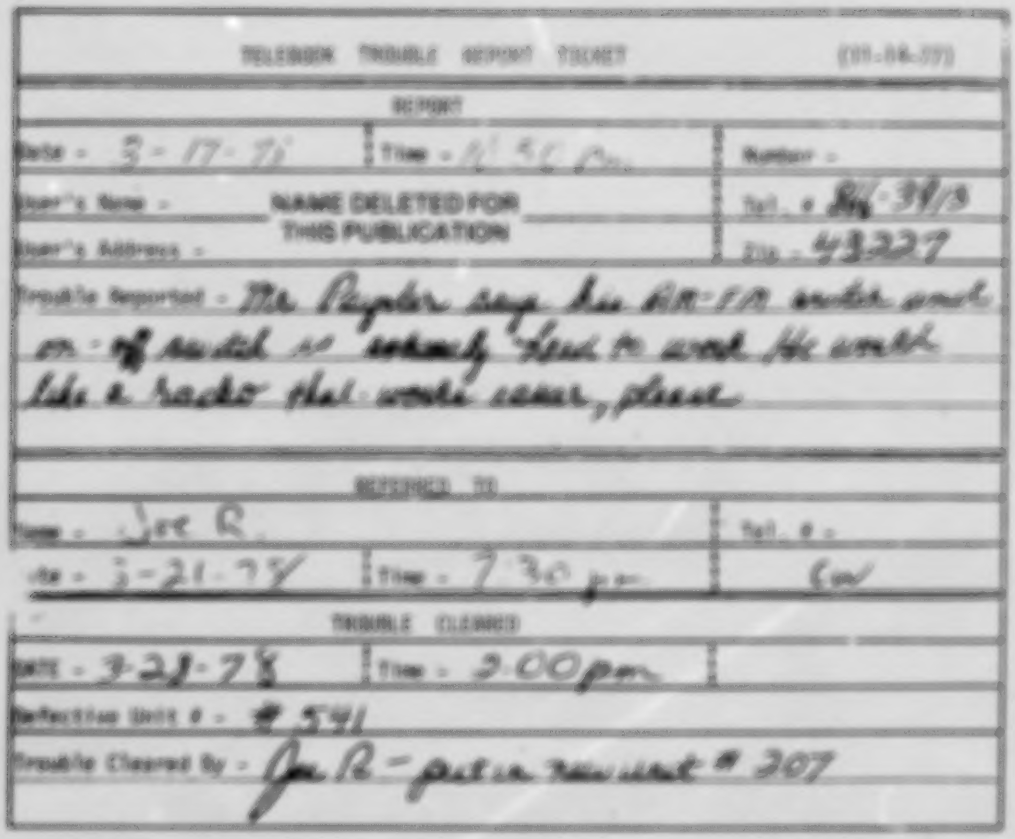
Another task assigned to the night operator was the maintenance of our file of books out for repair. When a cassette was broken or otherwise disabled, the book was withdrawn from the stacks, labeled, and set aside for the night operator to deliver to the person who repaired books for us. When he was given a book for repair, he filled out a card for a special file kept in the supervisor's desk indicating that the book was out; when it was returned, he marked the card "repaired" and placed it in the appropriate section of the same file. All operators were responsible for knowing how to clean the cassette players and the C--74 Talking Book player, but again, this job was generally done by the night operator, since he had fewer readers. His instructions for these tasks were posted in the office and are appended to this report.

As indicated earlier, each staff member was expected to reshelve all books used by readers during his particular shift; this, however, was not always possible. Also, all operators were required to keep accurate records of each transaction that occurred during his shift. Cleaning the work area became a responsibility shared by all concerned.

One special assignment, the filling out of trouble reports and contacting of the Telephone Pioneers who repaired and replaced our units became the responsibility of the 4:00 P.M. - Midnight person. When a receiver was found to be defective, the operator on duty filled out a trouble report (see Figure 11), pulled the reader card, and left both with the list of available Pioneers, which was arranged according to zip code. The evening operator would then contact a Pioneer who would then arrange a time to visit the patron and either repair or replace the unit. Spare units were stored in firehouses in each area of Columbus that Telebook served, and could be withdrawn only by a Pioneer. Again, instructions for this operation were posted in the office and are appended.

### 3.3 Daily Operator Procedure

Our general operating procedure developed quite naturally from that followed for the first reading session for each reader. The cable company technicians were responsible for installing the receivers, showing the readers how to operate them, and making the initial call to the Telebook center. When the operator answered, he would identify the reader, pull the reader card, verify the address, phone number and the cable company serving his area, and then play music from one of the continuously running tapes over one of the channels assigned to that company. The technician would assist the reader in finding the music, notify the operator when that had been accomplished, and then ask the reader to listen to our ten-minute introductory tape (a



[illegible] TROUBLE REPORT TICKET (11-16-77)

REPORT

Date = 3-17-78 | Time = 11:30 Am | Number =

User's Name = NAME DELETED FOR THIS PUBLICATION | Tel. # = [illegible]-3813

User's Address = | Zip = 43227

Trouble Reported = Mr. Pegler says his AM-FM radio unit on-off switch is extremely hard to work. He would like a radio that works easier, please

ASSIGNED TO

Name = Joe R. | Tel. # =

Date = 3-21-78 | Time = 7:30 pm | Cw

TROUBLE CLEARED

DATE = 3-28-78 | Time = 2:00 pm

Defective Unit # = #591

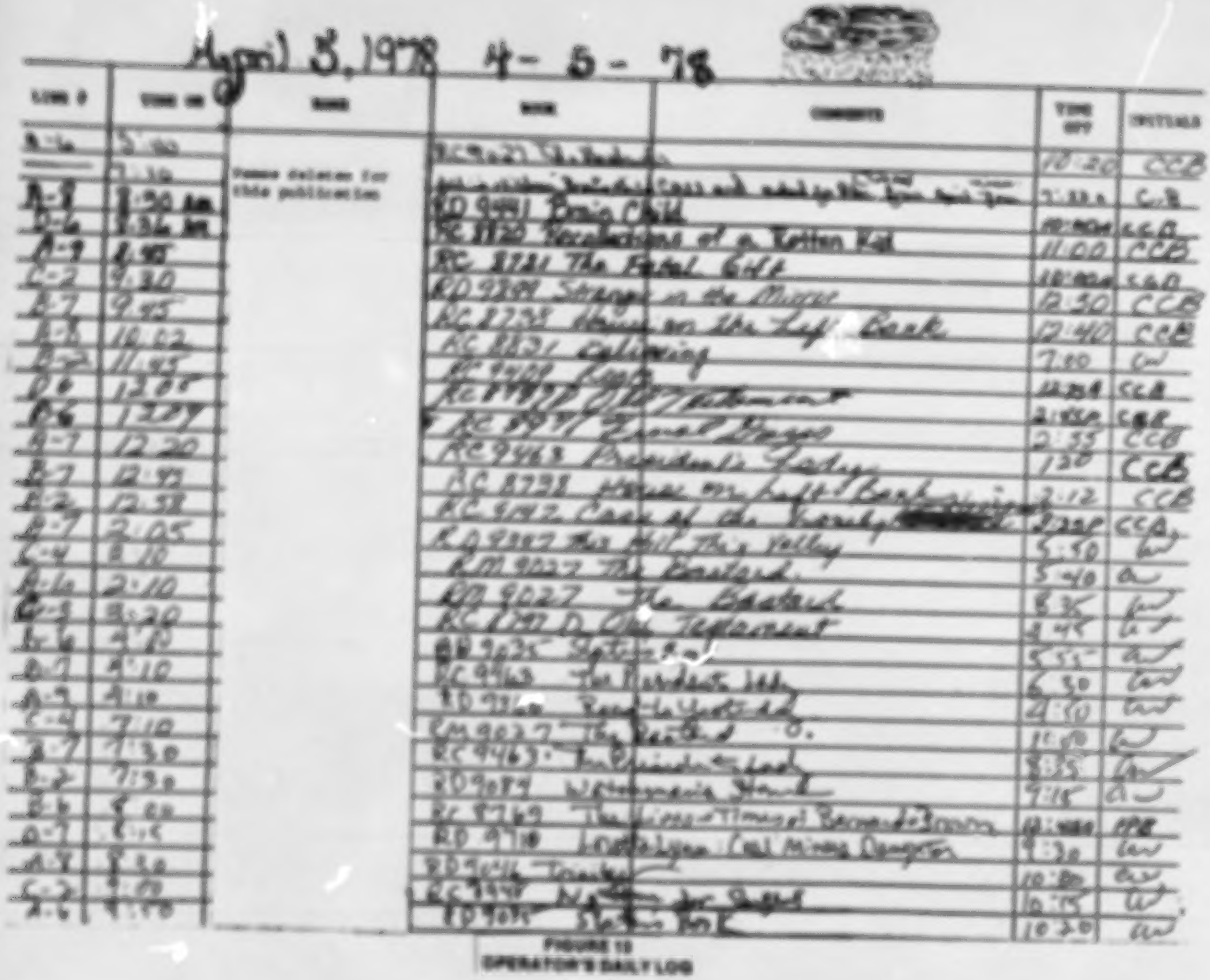
Trouble Cleared By = Joe R — put in new unit #307

FIGURE 11
OPERATOR'S TROUBLE REPORT

large print mailed version of this introduction is reproduced in Appendix IV). The reader would then call back the Talkbook center when the tape was finished, using the number embossed on the side of the receiver. In most cases, the reader followed instructions, and the operator would then encourage him to at least try a book; again, most of them complied. At this point, the operator would record the transaction on the reader card and in the daily log and play a book for the reader. Particularly in the case of older readers, it was sometimes necessary to play the introductory tape at least the first few times that they called; however, most of them learned to use the equipment with ease. At any rate, this became the standard procedure for operators. The operator would answer the phone, pull the reader card, turn on the music on an appropriate channel, and then aid the reader in finding it, after which he would get the requested book and play as much of it as the reader wished to hear. After the book had started, the operator would monitor the channel for quality, using the VU meter on the console as a guide for volume.

At this point, the operator would make the appropriate notations on the reader card (Figure 12) and in the daily log; e.g., the date, time of call, title and number of the book requested, and any comments or problems the reader had with the equipment (Figure 13). The console had to be monitored continuously so that the cassettes could be changed when appropriate. It was customary for the operator to feed the cassettes into the player until the reader called and indicated that he was through reading for the time. Some of our readers would

FIGURE 10
READER'S FILE CARDS



April 5, 1978 4-5-78

| LINE # | TIME ON | NAME | BOOK | COMMENTS | TIME OFF | INITIALS |
|---|---|---|---|---|---|---|
| A-6 | 5:00 | Names deleted for this publication | RC 9027 The Bastard | | 10:20 | CCB |
| | 7:16 | | [illegible] | [illegible] | 7:33 a | C.B |
| A-8 | 8:30 am | | RD 9481 Brain Child | | 10:40 am | CCB |
| D-6 | 8:36 am | | RC 8720 Recollections of a Rotten Kid | | 11:00 | CCB |
| A-9 | 8:45 | | RC 8721 The Fatal Gift | | 10:40 am | CCB |
| C-2 | 9:30 | | RD 9384 Strangers in the Mirror | | 12:30 | CCB |
| B-7 | 9:45 | | RC 8738 House on the Left Bank | | 12:40 | CCB |
| B-5 | 10:02 | | RC 8831 [illegible] | | 7:00 | [illegible] |
| B-2 | 11:45 | | RC 9400 [illegible] | | 12:25 A | CCB |
| D-6 | 12:00 | | RC 8997 Old Testament | | 2:45 P | CCB |
| B-6 | 12:27 | | RC 8971 [illegible] | | 2:55 | CCB |
| A-7 | 12:20 | | RC 9463 President's Lady | | 1:30 | CCB |
| B-7 | 12:45 | | RC 8738 House on Left Bank | [illegible] | 2:12 | CCB |
| B-2 | 12:58 | | RC 9142 Case of the Family | [redacted] | 2:20 P | CCB |
| A-7 | 2:05 | | RD 9307 This Hill This Valley | | 5:50 | [illegible] |
| C-4 | 3:10 | | RM 9027 The Bastard. | | 5:40 | [illegible] |
| B-6 | 2:10 | | RD 9027 The Bastard | | 3:35 | [illegible] |
| C-8 | 3:20 | | RC 7297 D Old Testament | | 3:45 | [illegible] |
| B-6 | 4:10 | | RD 9035 [illegible] | | 5:55 | [illegible] |
| D-7 | 4:10 | | RC 9463 The President's Lady | | 6:30 | [illegible] |
| A-9 | 4:10 | | RD 9960 [illegible] | | 4:50 | [illegible] |
| C-4 | 7:10 | | RM 9027 The Bastard | | 10:10 | [illegible] |
| B-7 | 7:30 | | RC 9463 The President's Lady | | 8:35 | [illegible] |
| B-2 | 7:30 | | RD 9084 [illegible] | | 9:15 | [illegible] |
| B-6 | 8:00 | | RC 8769 The Lives and Times of Bernard Brown | | 12:00 | [illegible] |
| A-7 | 8:15 | | RD 9710 [illegible] | | 9:30 | [illegible] |
| A-8 | 8:30 | | RD 9011 [illegible] | | 10:00 | [illegible] |
| C-2 | 9:00 | | RC 9440 [illegible] | | 10:15 | [illegible] |
| A-6 | 9:40 | | RD 9035 [illegible] | | 10:20 | [illegible] |

FIGURE 13
OPERATOR'S DAILY LOG

request that only one side of a given cassette be played at a time, but most preferred to read uninterrupted until finished. The time that a reader finished his session was also recorded on the reader card and in the daily log.

One of our early problems with readers who were less than adept mechanically was in determining whether their receivers were malfunctioning or whether they were not tuning it or handling it correctly. If a reader complained that he was getting nothing on his set, we would have to ascertain whether the set has been turned on, whether it was set for FM or AM, whether the volume was turned up to a point at which he could receive the broadcast, and whether both the coaxial cable and the receiver itself were plugged in. In about half of the instances of complaints, one of these items would have been ignored; some readers never became particularly adept at using the equipment. On the other hand, it must be admitted that an inordinate number of our receivers were defective.

Operators had to be aware that cassettes were either 2 or 4-track, and that the cassette player in the console had to be set accordingly in order for the book to play properly; new operators almost invariably had some trouble with this procedure. It was particularly easy to make a mistake in this area during a peak period, when readers were calling in every few minutes. However, once the concept had been mastered, and since the players clicked audibly when they changed tracks and displayed a red light when they stopped, the task was not as onerous as might be supposed. However, these signals did not obviate the necessity for the operators to monitor the console continuously except during slack periods.

Because the logger-rewinder machines created for the experiment proved to be less than successful, we began to use a C-74 Talking Book player obtained from the Ohio Rehabilitation Services Commission to do rewinding. Also, operators began to remove tapes at the readers' requests, note on the reader card what track they were on, return them to the box, label them with the reader's name, and reshelve them unrewound. Since we had at least three copies of each book in our collection, and since we had only 190-odd readers, this system proved eminently practical. Of course, with more readers, workable loggers would be essential.

We should mention that readers were encouraged to browse, and many of them took advantage of that feature of Telebook. Frequently, a reader would listen to an entire track before deciding against finishing the book. It was felt by the staff that many readers never got over the feeling that they were somehow imposing upon us if they took advantage of browsing to its fullest capacity, and most came to prefer the reader's services that we were able to render. In order to help a reader choose a book, the operator would first try to determine the reader's tastes, and then pull the appropriate section of the subject catalog and read the descriptions of possible choices to the patron. Most of our readers requested this sort of assistance at some time during the experiment.

In many instances, the Telebook staff had to order Talking Book Topics from the Cleveland Regional Library for readers who had no current copy. Also, the Regional Library proved invaluable in that they were usually able to send us a disc copy of a book damaged beyond repair; these discs were re-recorded on cassettes by Irwin Hott of the Radio Reading Service and then returned to Cleveland. It is safe to assert that we could not have functioned effectively without the backup service provided by the Regional Library.

We discovered that various factors affected reading patterns, and that these were similar to those found in the sighted/nonhandicapped community. For instance, readership declined dramatically between Thanksgiving and the Christmas holidays and then surged upward again; the obvious conclusion is that our readers were occupied by other concerns during this period. Interestingly, during the blizzard of '78, during which we were constantly open, reading was negligable in terms of the numbers of patrons who were obviously homebound by the weather; we surmise that they found radio and television reports of the blizzard, or perhaps other members of the family then home, more entertaining than reading Talking Books. Also, one could glance through the daily log from the middle of April onward and tell which days were pleasant; serious reading would not commence on nice days until the early evening hours.

We determined that peak reading periods occurred between 10:00 A.M. and Noon, between 2:00 P.M. and 4:00 P.M., and from about 5:00 P.M. to 9:00 P.M. During these periods, typically as many as 11 of our 16 working lines were busy. For example, all eight lines to Warner, both lines to Coaxial-Bulah, and one of the two to Coaxial-Cleveland. It was also noted that readers tended to read at an accustomed time each day, or even when they did not read every day.

### 3.6 Problems

One problem that we faced during the Telebook experiment was that cable lines were in place primarily in the suburbs and more affluent sections of Columbus, where there is apparently more profit to be made. We could not reach some areas where significant numbers of blind and handicapped people are concentrated. In Columbus, most of the inner city was unserved by cable during the Telebook experiment. Had we been able to place receivers, for example in the Metropolitan Housing Towers, I believe we might have significantly added to our readership.

Another problem was that the logger-rewind devices created for the experiment did not function as expected. These proved unsatisfactory because the Talking Books have leaders of both various colors and different optical densities; consequently, the photoelectric cells which trigger the mechanisms either could not "see" the tape and would not start, or could not distinguish between leader and tape and so would break the leader instead of stopping. As previously stated, a larger operation would definitely require workable loggers.

Finally, we were plagued by our inability to make institutional placements of receivers. The School for the Blind could not be served because, while it is in a cable area, it is not close to a cable line.

This problem is typical of the situation we faced in regard to institutions. Many expressed only polite interest, while most simply could not be served because of location.

### 3.7 The Automatic System

The Automatic Telebook System required extensive debugging after it arrived. Even after this delay a telephone line overvoltage from a nearby electrical storm rendered it inoperable for nearly three weeks. However, the relatively short trial over the remaining two months convinced us that it is a functional, if somewhat more expensive method of Telebook delivery in small cities. Like the semi-automatic system, it sends voice signals from the Talking Book cassette inserted in its players to FM modulators, which converts the signal to FM and which is broadcast on the cable. The reader accesses it by dialing a special number. He then hears another dial tone, and then dials in his own telephone number followed by the # button on the phone. Although this system requires Touch-Tone phone to activate it a recent innovation allows dial phone as well. After the reader thus accesses the machine, he hears a taped message, either indicating that he has started his book playing; or that all available channels are being used; or that he has dialed an unrecognized code. If the machine is starting the readers book, the machine then emits a wailing noise to which the reader tunes his radio. After a minute and a half of this his book begins. The machine must be loaded each day, and patrons must call requests for books into the Telebook Center. We have found that automatic Telebook readers require operator telephone services similar to our other readers. Their reading patterns seem almost identical. Some patrons on this system read prolifically, and others very little. On the basis of only a short trial we are convinced that the automatic system has proven to be a viable means of Talking Book delivery, even though detailed reader statistics are skimpy, and probably adversely affected by the startup problems, delays and the short trial period.

### 3.8 Operator - Reader Relations

At this point, we should mention the reception of Telebook by the readers, and their unfailing courtesy and helpfulness which they exhibited throughout the duration of the project. At the beginning of our period of service to the blind and handicapped of Franklin County, we experienced no little apprehension as to how our project would be received by the readers. However, it soon became apparent that they were generally delighted with our service. In the early stages of operation, of course, the staff was still gaining familiarity with both the equipment and the broadcasting procedures. In fact, during this period, it was not unusual for an operator to take a considerable time to find the reader's place in the book, or in some cases, simply to cue him in to the proper channel. After they explained to the patrons that they were still awkward in the use of the equipment, the readers unfailingly responded with encouragement, usually to the effect that no hurry was necessary and that they were enjoying learning to use the receivers. The more technologically sophisticated of our readers, and there were several of these, were generally ready with a suggestion intended to facilitate whatever phase of operation was in progress, while those who lacked this capability quickly won our affections with their kindness and tolerance of our awkwardness. The early mistakes were, of course, repeated by new operators as the months went by and our original staff was shrunk by illness and accidents, and the readers continued in their attitude of tolerance, in most cases recognizing without being told that the operator was new, and generally offering the same encouragement that they had in the earliest phase.

One aspect of our service which drew copious praise was our capacity to render low-level "librarian" services through the use of our subject catalog. The readers more and more frequently depended on the operator on duty to aid them in book selection rather than depending solely on Talking Book Topics. In fact, several of our readers had such confidence in the operators' knowledge of their reading preferences that they would simply call and request that the staff select a list of books for them to read, and to have them played in any convenient order. We maintained such lists for ten to fifteen of our readers.

As has been indicated earlier, our receivers had a high rate of initial failures; a few patrons had their radios replaced four times. Again, this annoyance, which might have been the cause for some chagrin and consequent acrimony, was handled by the patrons with admirable equanimity. They became accustomed to our replacement procedures, and we are proud to report that only two readers became so disillusioned with the receivers that they discontinued service.

Finally, we should mention the fact that our operators developed friendships among our reader population. It was not uncommon for a reader to call simply to chat with a favorite staff member, and during slack reading periods we did not at all discourage this practice. On the other hand, all of these readers were more than willing to hang up if the operator on duty was either busy operating the console or engaged in other assigned tasks. We concluded from this evidence that the quality of our operator-patron relations was of the highest, and we were, and remain, exceedingly grateful for their patience and understanding, as well as for their continuing good natured response to our efforts.

## 4.0 TECHNICAL MEASUREMENTS

A series of technical measurements were performed to determine comparative, quantitative parameters of audio quality for the semi-automatic and automatic Telebook systems, and production Library of Congress General Electric Model C-74 players, used by many Talking Book readers in their homes. The parameters compared were: frequency response, wow, flutter, weighted combined wow and flutter, intermodulation distortion, harmonic distortion, signal to noise ratio, and deviation from proper playback speed. The source of signals for the measurements were special cassette tapes supplied by the Library of Congress. In addition, a relevant subset of these measurements were repeated at different test points along the transmission paths from the semi-automatic system to the output of the readers radio in the home to determine not only overall quality, but to determine if there were "weak points" in the system that might be excessively degrading audio signals.

These measurements were made in late May 1978 by a sub-contractor to MITRE, Fred Allemeier, of the Central Ohio Radio Reading Service. Ten samples each of the playback units of each type were used. Five telephone lines including lines to each of the three CATV systems were tested; the output of ten modulators - again including some on all three cable systems - and measurements at two homes on the cable (one Warner, one Coaxial) using at both the Telebook receiver found there, and also a high quality receiver as a reference. The latter two measurements were made at the headphone jack of each receiver, to eliminate effects of room acoustics.

All of the equipment and sites were picked at random. None of the equipment tested was brand new. Some had been used considerably. And as can be seen from the raw data, Figures 14 and 15, some units were obviously performing poorly. The author believes however that the column labeled C9, semi-automatic, contained a measurement error--unique frequency response dropout at 1 KHz of 20 DB, which was ignored for analysis.

The raw data is combined and averaged by equipment category in Figure 16, which also includes the standard deviation of the individual samples performance for each category. These are especially important because of the wide sample to sample variation in performance for many of the units and for many of the parameters measured.

To assist interpretation for those not familiar with audio engineering terminology, some comments on the data follow. Intermodulation distortion is undesired interaction between different tones in the original signals (50 and 1000 Hz in our test) producing new tones that were never in the source signal. Harmonic distortion also produces new frequencies not present in the source material, that are multiples of the frequency. Both can cause lack of legibility, or "fuzziness" or "raspiness" in the sound. High fidelity equipment intended for home use often has values of both distortions controlled to less than 1%; good equipment only a fraction of that. However, most equipment listed in our chart vary between 3% to 6% distortion--a value still very good for equipment designed just for voice information transfer, such as the telephone. Such distortion is almost

| | SEMI AUTOMATIC SYSTEM<br>[illegible] | | | | | | | | | | AUTOMATIC SYSTEM | | | | | | | | | | STANDARD PLAYBACK UNIT<br>[illegible] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | | | | | | | | |
| Operating Level | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Wow | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Flutter | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Intermodulation (%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Total Harmonic Distortion | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Signal to Noise (S/N) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Speed Deviation (%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

FIGURE [illegible]
COMPARATIVE MEASUREMENTS ON TAPE PLAYERS

| | PHONE LINES | | | | | MODULATORS | | | | | | | | | | Tele-Spade Recvr | | Refer-ence Recvr | ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | * | * | WA | WA | WA | CC | CC | AA | AA | ◆ | ◆ | ◆ | ◆ | CD | CD | | | | |
| Operating Level | -36 | -20 | -20 | -22 | -20 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | [illegible] | [illegible] | -6 | -6 |
| 50Hz | -1 | -9 | -9 | -3 | -2 | 0 | -9 | -9 | -3 | -9 | -1 | -1 | -9 | -3 | -2 | -7 | -10 | -8 | -8 |
| 100Hz | -2 | -1 | +1 | 0 | +2 | +2 | -1 | -2 | -3 | -1 | +5 | 0 | -2 | -2 | +1 | -2 | -2 | -8 | -2 |
| 400Hz | 0 | 0 | +2 | +1 | +3 | +1 | 0 | 0 | 0 | +1 | +4 | +1 | 0 | 0 | +2 | 0 | +1 | -1 | 0 |
| 1KHz | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2KHz | 0 | 0 | -4 | -3 | -4 | +2 | 0 | -2 | 0 | 0 | +1 | +1 | 0 | -2 | 0 | -2 | -2 | 0 | -4 |
| 2.2KHz | 0 | 0 | -3 | -2 | -4 | +2 | 1 | -2 | 0 | 0 | +2 | +2 | 0 | -2 | -1 | -2 | -2 | -1 | -4 |
| 2.4KHz | 0 | 0 | -2 | -1 | -4 | 0 | 0 | -3 | -1 | 0 | +1 | +1 | 0 | -2 | -1 | -1 | -2 | -2 | -3 |
| 2.6KHz | 0 | -1 | -2 | -1 | -4 | +1 | -1 | -3 | -1 | -1 | +1 | 0 | 0 | -2 | -1 | -1 | -3 | -3 | -3 |
| 2.8KHz | 0 | -1 | -3 | -4 | -6 | +2 | -1 | -2 | -1 | -1 | +2 | +2 | 0 | -2 | -1 | -4 | -3 | -3 | -4 |
| 3KHz | -2 | -2 | -10 | -7 | -10 | +2 | 0 | -3 | -2 | 0 | +3 | +2 | 0 | -2 | -1 | -2 | -4 | -2 | -4 |
| Intermodulation (%) | 40 | 10 | 3 | 6 | 3 | .6 | .6 | .6 | .6 | 3 | 3 | 2.7 | 3 | .2 | .2 | 7 | 8 | 8 | 7 |
| Total Harmonic Distortion | 9 | 6 | 3 | 3 | 3 | 1.7 | 2 | 2.8 | .7 | 2.8 | 3 | 2.2 | 3 | 1 | 2.8 | 3.6 | 3 | 3 | 6 |
| Signal to Noise (S/N) | -36 | -35 | -35 | -40 | -38 | -35 | -38 | -45 | -46 | -27 | -35 | -37 | -34 | -42 | -40 | -40 | -41 | -46 | -31 |

* Unloaded ATT American phone lines   WA: Warner Cable, AA and CD: Comcast—Beulah Road

** Olson Model #[illegible]

CC Comcast Cable at Cleveland Avenue

AA ATT American

◆ Warner Cable

CD Comcast Cable at Beulah Road

FIGURE 10
MEASUREMENTS ON TELEBUCH SYSTEM TEST POINTS

|  | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | $\bar{X}$ | σ | $\bar{X}$ | σ | $\bar{X}$ | σ | $\bar{X}$ | σ | $\bar{X}$ | σ | $\bar{X}$ | σ | $\bar{X}$ | σ |
| Intermodulation(%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Total Harmonic Distortion(%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Signal to Noise Ratio (dB) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Wow (%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |  |  |  |  |  |  |  |  |
| Flutter (%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |  |  |  |  |  |  |  |  |
| Wow & Flutter Weighted (%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |  |  |  |  |  |  |  |  |
| Speed Deviation(%) | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |  |  |  |  |  |  |  |  |
| Typical Frequency Response [illegible] | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  | [illegible] |  |

[illegible]

[illegible]

negligible for the application intended, which includes transmission of all manner of subtle voice shadings in addition. Also, the limited frequency response and dynamic range of Talking Book material--about 3 KHz and 40 db respectively--as compared to music recordings--about 20 KHz and 60 - 70db--serves to limit both the amount and detectability of distortion products by the listener. The standard deviations show however that the players responded with wide variation to distortion measurements. Especially among the C-74's (see Figure 14). Some of these players (e.g. the C-74 units having 20% distortion or more) are obviously in need of repair.

In measuring signal-to-noise ratio, the larger the value, the cleaner one perceives the sound. Noise can be generated from many sources, such as magnetic tape "hiss" or 60 cycle hum picked up on telephone lines. Anything above 20 db in this application would probably not effect much legibility (but might effect listener fatigue). Any value above 30 db would be considered fine by most listeners. At 40 db most listeners would probably say the noise is imperceptable. By this standard, it is seen that all players passed this test mark - two of the automatics barely - but not the defective phone line (# 9 to Warner not used by operators for service) that also had unusually high (40%) distortion and had unusually poor signal to noise ratio, 16 db (see Figure 15).

Wow and flutter are terms given to rapid variations in tape speed, descriptive of their respective effects on a sustained recorded tone, the former being slower variation and the latter faster (frequency modulation of a recorded tone). The weighted combined value takes into account the response of the ear over a combined larger frequency spectrum of tone pitch "wobble rate". For music playback most people probably will not notice deleterious effects beneath 0.25% wow and flutter. But speech has few sustained tones, and such tones tend to be low in frequency where "wobble" in pitch is less noticeable anyway. For our application anything beneath 0.5% is considered very good, and almost all units met that criteria (see Figure 14).

Speed regulation effects both the absolute pitch and rapidity of enunciation of recorded speech. Note in Figure 16 that all three systems had sample variations, giving a standard deviation of about 3% about the mean value for that type of player. My guess is that many people would notice a speed variation greater than 5% from the correct value. If on the high speed side, many Talking Book readers would likely not mind. Some obviously like their books read at a faster than normal pace. All player systems averaged out on the high side, 3.55%, 7.75%, and 3.4% for the semi-automatic, automatic and C-74 respectively.

The wider the frequency response, the more natural sounding will be the resulting sound (assuming noise and distortion are reasonably low). It is generally considered that approximately 3 KHz of bandwidth is adequate to faithfully reproduce spoken voice. An ideal delivery system would reproduce all frequencies with equal amplitude. Frequency response measurements determine variation from this ideal, with a variation of 6 db representing a perceived difference of 2:1 in relative loudness. For summary data, we ignored values for the very highest tone, 3 KHz, and lowest, 50 KHz since at these limits the response of many components of the system tend to decrease erratically.

A variation of plus or minus 3 db would likely still be considered hardly noticeable by most, and tolerance of 6 db still good by many readers, in my opinion. The somewhat larger variation plus and minus 10 db for many of the C-74's (even those not obviously malfunctioning with excess distortion) might possibly be explained by the center position of the tone control possibly not representing true "flat" adjustment of the players frequency response. In the home, a reader could presumably compensate for some such variations by readjusting the controls. The Telebook systems had no tone controls.

What might be surmised from all this? That depends on interpretation and the weight of importance for subjective listening quality ascribed to each parameter. For the sake of discussion, this observer puts forth the following opinion. Especially given the numerical size of the standard deviations, there are no significant differences in audio quality for any of the systems apparent from the measurements on the average.[7] Any one individual however may have an extra good or extra bad signal, with almost equal likelihood from any of the three systems.

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[7] A possible exception is that the Telebook players tended to be systematically on the high side of speed variation, where C-74 players have both high and low speed variations. Another is greater variation in C-74 frequency response from flatness. This can often be corrected by the reader however, by manipulating the tone controls.

Two further notes to assist interpretation. The signal to noise ratios on the Ohio raw data have a minus sign appended. Ignore it. Also it is seen that some parameters sometimes seem better than might be expected, on average, at the output of the radio receiver, based on tests at an earlier point in the system. A possible cause is suggested. The sharp frequency limiting effects of the telephone lines at the high (hiss) and low (hum) frequencies, and the same effect at the Telebook receiver, tends to improve, for example, measured signal to noise ratios, and reduce higher frequency harmonic distortion products above 3 KHz.

Following is a listing of the more important test equipment used in measuring audio quality:

| | |
|---|---|
| "Wow" and flutter meter | Leader Model #LF36 |
| Distortion Analyzer | EICO Model #902 (calibrated with Sound Technology Model #1700) |
| Modified Tuner | Olsen Model #RA524 (tuned to 98 to 120 MHz) |

## 5.0 MODIFIED LONG TERM COST PROJECTIONS

The results of the Columbus experiment contained some surprises relative to the numbers previously used in calculating long term operating costs. Readers tended to read for much longer periods of time at one session than in the pilot Telebook in Washington, D.C., using the telephone. Columbus readers averaged 2.4 hours per session, instead of the 1 hour of the previous experiment. This meant that for any given total number of readers, our calculations would show a proportionate 2.4 times increase in time between operator transactions including peak hours. Also, consistent with this, we found that the Columbus Telebook reader averaged 13 hours of reading a month, versus the 10 hours derived from LOC averages used in the original cost projection.[8]

Our formulas for calculating the maximum numbers of active readers that can be served by a given size semi-automatic system, which we still believe valid, thus show that for the twenty channel, one operator system that evolved in Columbus, is capable of handling 460 active readers, which is over twice the number we actually served. This is consistent with operator activity observation during peak hours, and of course, non-peak hours, as explained in the footnote accompanying the analysis that follows. We and the operator agree the increased work load would definitely be good for operators' morale.

---

[8] All numbers regarding reader behavior in Columbus are based on logs for the days Aprils 4,5,25, and 26. The numbers derived, as well as the logs themselves, seemed typical to the local supervisor.

But there is another, even more important implication. The 20 channel system used in Columbus is probably large enough to handle the entire Columbus population fraction--about 800 readers--that could reasonably depend on Telebook for its sole source of reading.

The above conclusion is based on the relatively high reading activity of our experimental readers (not to mention that many of them probably continued to also use their home player in addition to Telebook) relative to national averages. But also the implications of some of our experiences, that can be further verified by LOC with an examination of the past reading habits of both the Telebook readers and non-Telebook readers, analyzing such records held by the Cleveland Regional Library. As a result in the footnote on page 63 of this report we changed our estimate of "active" readers for Telebook purposes from two-thirds of the total readers in the year's analysis to one-third, i.e., that group of readers which together averages 13 hours per month reading. This reduction in active readers is based on two non-rigorous observations during the Columbus experiment. First, data already submitted to LOC on the first approximate 50 Telebook readers' previous circulation figures from the Cleveland Library, compared to their actual reading with Telebook, showed that they probably were previously reading only about 20% of the material that was being sent to them; versus the one-half previously derived on page 62 of our earlier analysis. And in a mini-survey these same readers indicated they were mostly reading more with Telebook than before. The second evidence is the shrinkage of total readers available to Telebook.

Originally it was thought the list might contain about 1800 names. Apparent purging of readers inactive for more than a year reduced the list to about 1100 names. As explained in Section 3, only about 400 of these were contactable by either the telephoning or mail methods (return a card) of Telebook. A few hundred of the 1100 are believed in institutions...say 300 for discussion. We think it might be found that a large number of the remaining 400 might prove to be readers who, in fact, seldom read.

Now the importance of all this to the semi-automatic Telebook cost projection is that costs for this system are mostly incurred for actual reading hours, since the fixed cost of amortizing home hardware (which costs about $17) is so small. Thus servicing all the remaining readers not institutionalized, in the Columbus example, about 800 readers total, would not, if our reasoning and evidence is approximately correct, cause a significant increase in work load for the operators over the 460 (thirteen hours a month) readers we believe they can already comfortably handle. Put into overly simplified terms, we found both in Washington and in Columbus roughly half the population contacted volunteered to be in the experiment; in both cases the other approximate half of the population we had no direct contact with is suspected of containing a disproportionately large number of infrequent readers. The semi-automatic system from a cost standpoint capitalizes on this situation - instead of being penalized - as is the conventional system. It is for the above reason that the figure of 800 readers is used on Page 54. We use 78 hours to calculate cost per reader per year instead of using the 156 hour per year reading average of our Columbus readers, only to calculate cost per reader hour because we pessimistically assume that the 340 additional readers so signed up yield little perceptible reading load, and we also assume reading of the rest declines somewhat because of "loss of novelty" effects.

The implications on cost of the above reasoning for the automatic Telebook system are not so benign. By its nature the automatic system normally dedicates a $625 player (i.e. $15,000 system purchase price ÷ 24 players) to one reader. If that reader is not very active, things get worse in terms of cost per reading hour--not better. For our cost analysis of the automatic system we assumed therefore that the following step would be taken to minimize this problem. If a reader does not use his cassette over a period of two weeks, it would be removed from the machine until he calls again, and soon the cassette of another recent requester would likely be put into his place. Based on an examination of our automatic system's computerized logs, it would seem that this procedure might allow at least two and perhaps as many as four times the number of readers to use the system as the 24 players in it. Thus 50-100 readers per 24 player system is indicated on page 56.[9] Perhaps even more might be accommodated, but that requires an LOC analysis of the complete logs of the automatic system, and likely more operating experience, to determine an answer confidently. In any case, the number of readers the system can serve directly effects the cost estimate arrived at. Our figures in this case show the range for 2-4 times the number of players to find the cost of servicing readers with good service. This is consistent with our sample of the much more extensive records of the semi-automatic reader's behavior, which will later be completely analyzed by the Library of Congress.

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[9] This is equivalent to reducing capital cost to as low as $156 per reader. An alternate approach yielding similar cost, and possibly less risk is the purchase of automatic systems having 48 players, at $25,000 apiece (quantity purchase) and share each player, on average with only two readers, yielding a per reader cost of $125. More service tests with the automatic system would yield better guidance for choosing between these options.

Following is a chart summarizing the costs from the analysis which follows.

### TALKING BOOK DELIVERY COSTS PER READER

| | ANNUAL COST | | TOTAL CAPITAL (not amortized) | | YEARLY OPERATING COSTS | |
|---|---|---|---|---|---|---|
| | OLD | NEW | OLD | NEW | OLD | NEW |
| CONVENTIONAL | $93.20 | | $232.00 | | $70.00 | |
| SEMI-AUTOMATIC | $42.56 | $54.53 | $68.44 | $38.12 | $35.72 | $50.72 |
| AUTOMATIC | $57.90 | $79.10-$158.20 | $229.00 | $185-370 | $35.00 | $60.60-$121.20 |
| MANUAL | $75.00 | | $102.16 | | $64.80 | |

THE FOLLOWING ELEVEN PAGES ARE QUOTED DIRECTLY FROM MITRE REPORT M76-93, "REPORT AND PROPOSAL TO THE LIBRARY OF CONGRESS REGARDING A MEDIUM SCALE TRIAL OF ADVANCED TELEBOOK SYSTEMS," BY K. J. STETTEN, DECEMBER 1976, WITH ANNOTATIONS ONLY ON THOSE COSTS OR COST ELEMENTS THAT ARE CHANGED BASED ON RESULTS OF THE COLUMBUS, OHIO EXPERIMENT.

## Long-Term Costs - Semi-automatic Telebook System

**Assumptions:**

Equipment amortization: 10 years (to obsolescence); no interest charges

Size: (20) ~~40~~ simultaneous reader channels

Readers average (13) ~~10~~ hours (1 book equivalent) of listening per month*

System utilization averages 42% peak capacity (10 hours accumulated use per channel per day)*

Operator peak capacity: 1 call (for stop or start) per 2.4 minutes

Average reading duration: (2.4) ~~1~~ hour (per Phase I Telebook experiment)

Maintenance averages (5%) ~~10%~~ of equipment cost per year

System staffed and operated around the clock.

**Derivation:**

$$\text{Number of readers served} = \frac{\text{System listener-hours used per month}}{\text{Average monthly reading per reader}}$$

$$\frac{(20)\ \cancel{40}\ \text{channels} \times 10\ \text{hours utilization/channel/day} \times 30\ \text{day/month}}{(13)\ \cancel{10}\ \text{hours monthly reading/reader}}$$

$$= (460)\ \cancel{1000}\ \text{readers}$$

Since approximately 0.1% of U.S. population are active users of Talking Books, this size Telebook Center might be adequate for a metropolitan area -- (1 million) ~~400,000~~ - 2 million population. The semi-automatic

---

*The actual system utilization in Columbus was five hours accumulated use per channel per day. However, both authors are convinced that the original 10 hour figure could be handled by the single operator per shift in Columbus, even during peak hours, under the following expected conditions for a long term implementation: a reliable logger-rewind device, updating operator records during off peak hours, and reducing the amount of records (e.g. book titles, comments, time started and stopped) kept when the service is no longer an experiment.

Telebook system size could, of course, be scaled upward or downward (e.g. (40) ~~[illegible]~~ channels, 1 operator at peak periods, for a city of (? million) ~~[illegible]~~) depending on size of the city, and exact reader demand experience found in Columbus.

Yearly Long-Term Operating Costs for the Semi-automatic Telebook System:

| | | OLD | NEW |
|---|---|---|---|
| (20) ~~[illegible]~~ | FM Modulators @ ($500) ~~[illegible]~~ = ($10,000) ~~[illegible]~~ ÷ 10 yrs | ~~[illegible]~~ | ($1000) |
| (800) ~~[illegible]~~ | FM Receivers @ $15 = ($12,000) ~~[illegible]~~ ÷ 10 yrs | ~~[illegible]~~ | ($1200) |
| (20) ~~[illegible]~~ | Modified Automatic Tape Decks @ ~~[illegible]~~ ($175) = ($3,500) ~~[illegible]~~ ÷ 10 yrs | ~~[illegible]~~ | ($ 350) |
| (2) ~~[illegible]~~ | Automatic Indexing Devices $5,000 ÷ 10 yrs | 500 | |
| | Maintenance Technician 200 hrs @ $10/yr | ~~[illegible]~~ | (0) |
| | Office Rent | ~~[illegible]~~ | (0) |
| | Local Supervision 400 hrs @ ($6) ~~[illegible]~~/yr | ~~[illegible]~~ | ($2400) |
| | Library-technician 2000 hrs @ $4/hr | ~~[illegible]~~ | (0) |
| | Operators (8,640) ~~[illegible]~~ hrs @ $2.73/hr* | ~~[illegible]~~ | ($23,000) |
| 2 | Business rate telephones @ $20/month | 500 | |
| | Tie lines (if needed) to head end | ~~[illegible]~~ | ($7200) |
| 2400 | Standard LoC production cassettes, @$2.80; average of 2 copies each of 1200 books/yr | 6,720 | |
| | | 120/yr | |
| | Total | ~~[illegible]~~ | ($43,630) |

÷ (800) total ~~[illegible]~~ readers = ($54.53) ~~[illegible]~~/user per yr

÷ (78) ~~[illegible]~~ hours reading/user per yr = ($0.70) ~~[illegible]~~/hour of reading

---

*(3) ~~2~~ operators during day and evening shifts; 1 operator for midnight shift

**Redefined based on experiment. See page 63.

Long-Term Costs - Automatic Talebook System

Assumptions:

Equipment amortization: 10 yrs (to obsolescence); no interest charges

(6)
Size: ~~24~~ simultaneous reader channels (24 players)

(17)
Readers average ~~[illegible]~~ hours (1 book equivalent) listening per month*

System utilization averages 42% of peak capacity (10 hours accumulated use per channel per day)*

(2.6)
Average reading duration: ~~[illegible]~~ hour (means 20 calls per hr; peak)

(10%)
Maintenance costs average ~~20%~~ equipment costs per yr

System operated around the clock

Library-technician available by telephone normal work hours, automatic answering device records new requests at other times*

(50-100) (100,000)
Capacity: ~~200~~ readers - for cities 100-~~200,000~~ population (same assumptions as semi-automatic system, except ~~24~~ (6) channels instead of ~~40~~) (20)

(6)
Equipment cost: about 50% of present cost for ~~24~~ channels (24 readers) from Sudbury Systems Inc. (depleting one time engineering costs, and quantity purchase)

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* A telephone answering device was not necessary in Columbus since the Semi-automatic system was staffed 24 hours per day and received messages.

[illegible] Long-Term Operating Costs for the Automatic Talkbook System:

| | | [illegible] | [illegible] |
|---|---|---|---|
| (4) ~~20~~ | FM Modulators @ ($500) ~~[illegible]~~ = ($2,000) ~~[illegible]~~ ÷ 10 yrs | $ 300 | ($200) |
| (100) ~~200~~ | FM Receivers @ $15 = ($1,500) ~~[illegible]~~ ÷ 10 yrs | ~~300~~ | ($150) |
| 1 | Automatic Talkbook System ($15,000) ~~[illegible]~~ ÷ 10 yrs | ~~[illegible]~~ | ($1,500) |
| 2 | Business rate telephone lines @ $20/mo | 500 | |
| | Maintenance 200 hrs @ $10/hr | 2,000 | |
| | Library-technician (600) ~~[illegible]~~ hrs @ $10/hr | ~~[illegible]~~ | ($6,000) |
| | Supervision (600) ~~[illegible]~~ hrs @ $10/hr | 6,000 | |
| 1600 | Standard 1/4" production cassettes yearly @ $1.00;<br>~~40~~ copies of best sellers only | ~~[illegible]~~ | ($1,600) |
| | (1) Total | ~~[illegible]~~ | ($7810) |

(50-100)total ($78.10-$156.20)
÷~~[illegible]~~ ~~[illegible]~~/readers = ~~[illegible]~~/user per yr
(78) ($1.00-$2.00)
÷~~[illegible]~~ hours reading/user per yr = ~~[illegible]~~/hour of reading

## Long-Term Costs - Manual Telebook System

Assumptions:

Equipment amortization: 10 yrs (to obsolescence); no technical changes

Plant: 30 simultaneous reader channels

Readers average 10 hours (1 book equiv.) listening per month

System utilization averages 60% of peak capacity (14 hours accumulated use per channel per day)

Operator peak capacity: 1 call every 2 minutes

Average reading duration: 1 hour

Maintenance averages

System operated around the clock; 5 operators during 3 peak shifts

Capacity: 650 readers -- adequate for cities of 100-400,000 population (derived from same assumptions as semi-automatic system; 30 lines instead of 60 lines -- one-half the operator productivity of the semi-automatic system)

Yearly Long-Term operating costs of the Manual Telebook System:

| | | |
|---|---|---|
| 30 | FM Modulators @ $300 = $9,000 ÷ 10 yrs | $ 900 |
| 900 | FM Receivers @ $15 = $13,500 ÷ 10 yrs | 1,350 |
| 30 | Standard LoC Cassette Players @ $75 = $2,250 ÷ 10 yrs | 225 |
| 2 | Business rate telephones @ $20/mo | 500 |
| | Office rental | 4,800 |
| | Maintenance technician 100 hrs @ $10/hr | 1,000 |
| | Local Supervision 400 hrs @ $10/hr | 4,000 |
| | Library technician 2000 hrs @ $4/hr | 8,000 |
| | Operators 14,400 hrs @ 2.75/hr | 40,000 |
| 2400 | Standard LoC Cassettes (average 2 copies each of 1200 books/yr) | 6,720 |
| | Total | $67,495/yr |

÷400 users = $75/user per year

÷120 hours reading/user per yr = $0.62/hour of reading

## Long-Term Costs -- Conventional Talking Book Delivery

### 1. Mail Costs

Assumptions:

An average Talking Book (Discs and Mailing Box) weighs 2 lbs.

An average Talking Book (cassette and box) weighs 12 oz.

An average Braille Book weighs 6 lbs.

An average Braille Magazine weighs 8 oz.

An average mailing to a user is two postal delivery zones

The following data is from the annual report of the U.S. Postal Service:

Free Matter for the Blind

| | | |
|---|---|---|
| 1975 | $ 6.6 million | 18.9 million pieces |
| 1976 | $ 8.9 million | 19.1 million pieces |
| 1977 (est.) | $10.9 million | 21.2 million pieces |

From this we can derive average cost per piece (one-way mailing)

| | | |
|---|---|---|
| 1975 | $0.35 | |
| 1976 | $0.46 | 45% increase |
| 1977 | $0.51 | |

LoC staff estimate two-thirds of the free matter for the blind budget is for LoC materials, which is $4.4 million for 1975, $5.9 for 1976, and $7.2 million for 1977. These annual figures are roughly equal or greater than the yearly LoC expenditures for manufacturing Talking Book copies and playback machine production combined (averaged $4.5 million/yr, FY71-FY75).

An average mailing cost per Talking Book can be derived from fitting zone mailing weight-ratios to the budget, using 1975 budgets and 1975 LoC circulation (round-trip) figures:

7.4 million T.B. circulation @ $0.45/circulation = $3.3 million

.5 million Braille Book circulation @ $0.85/circulation = .4 million

.9 million cassettes circulation @ $0.25/circulation = .2 million

3 million magazines @ $0.10 = .3 million

$4.2

Misc. .2

1975 Total = $4.4 million

For 1977, these costs are estimated to rise 45% per piece, to

$0.65 per Talking Book circulation

$0.36 per cassette book circulation

It should be noted that these rates are still lower than present 4th class - book rate for two postal zones, which would be:

$0.90 per Talking Book circulation

$0.50 per cassette book circulation

And book rate itself is considered a subsidized class of mail.

We now derive mail costs per typical active user.*

40 book circulations per typical active user @ $0.50 per circulation (average of cassette and discs) = $20/yr

100 magazine deliveries @ $0.10 (1 weekly and 4 monthly ) = $10/yr

Total $30/yr

---

*Discussed later, but twice the LoC average of 21.7 per reader.

Average 5 year circulation per book copy, (from LoC) is 13.34. Multiplying this by the 1977 mailing costs, $0.65/book and $0.36/cassette, yields:

$8.67 mail cost per Talking Book lifetime

$4.80 mail costs per cassette book lifetime. This is about twice the cost to manufacture the recorded materials ($4.31 and $2.80 respectively for a Talking Book and a cassette book).

## 2. Typical Active Reader Derivation

Unlike conventional distribution, costs -- on the average -- are incurred for Telebook only when a reader actually listens to material. It thus becomes important when costing, or sizing, a Telebook system for a given population, to estimate how many hours of use of it will be made by the average reader.

No one supposes all the Talking Books and cassettes circulated to readers are read through. An estimate must be made of what percent of such material is actually read. Secondly, readers have different yearly book circulation averages -- and the distribution of circulation versus percent readers is not known -- only the average circulation. Since relatively inactive readers cost Telebook systems almost nothing we ignore them for costing purposes (somewhat to the derogation of Telebook) -- and concentrate on defining a "typical" active reader -- on which the previous Telebook, and following "conventional" book distribution analysis addresses. This allows comparison of well defined apples and apples.

Even if our numerical definition of the typical active reader are found somewhat in error, an even more precise unit of delivery of service is available: the cost of an hour's actual reading. This latter figure is independent of our judgments regarding a typical users reading habits -- and concentrates on the measure of true bottom line service delivery.

We start with some comments by regional librarians:

"average is 42 books per reader annually ...... but 5 out of 8 books are automatic circulated"

(a large library)

"295 patrons -- out of 468 -- read more than 1 book in the last three months ......, the former group averages 23 books per yr; really active readers receive about 40 books per year."

(a small library)

"if they are like me, I only read through about one third of what I take out of a library."

(a large library)

The five year average total circulation per reader, of Talking Books, from LoC figures, is 21.7, equal to 1.8 books per month. To this must be added magazines, averaging about 10 per year, or 0.8 magazines/month.

Assuming magazines average half the length of books, the LoC figures imply 2.2 book equivalents is the average circulation per month per reader. We arbitrarily, but we think reasonably, assume about one half of this material is actually read - for a "typical reader" definition of one book (equivalent) per month - or about ~~10~~ (13) hours of reading LoC materials. It is of course understood that a certain, unknown, percent of the population read very much more than these averages. Some librarians also expressed the suspicion that average actual reading for deposit collections was especially low. These constitute a significant number of listed readers. We thus also define our "typical active" reader, as receiving -- but not necessarily reading -- about 40 ten hour book equivalents per year, or 3.3 books per month. These assumptions are at least consistent with our Phase I survey, where most respondents indicated they ordered 1-5 books at a time, but only 42% said they read all of them.

3. Calculation for Conventional Talking Book Long Range Distribution Costs Per Typical Active Reader[1] (Annually)

| | |
|---|---|
| Mail Costs (derived earlier) | $30 |
| [2] Regional Library Costs (Including Playback Equipment Maintenance and Distribution) | $40 |
| [3] Playback Equipment Purchase and Spare Parts | $12 |

---

[1] Defined in the previous section. For conceptual purposes, assume ~~2/3~~ (1/3) of listed readers are in this category. The remainder are assumed to read much less than one book per month.

[2] This figure was found to be surprisingly uniform for those regional librarians queried -- one each in Ohio, Virginia and Pennsylvania. The figure included all their costs, including "overhead."

[3] Has averaged $6.12 over past five years, but switch to cassette players, and some readers having both is assumed to double the cost.

| | | |
|---|---|---|
| [4]Talking Book and Cassettes<br>(4 cassette book @ $2.80) | | $11.20 |
| | Total | $93.20 per reader/yr |

+ 120 hrs reading per year = $0.77/hour of reading

These figures do not, and should not include Talking Book related LoC overhead expenses that are essentially independent of mode of delivery, quantity of new book issues, and quantity of playback equipment material distributed (which is perhaps $30 annually per reader).

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[4] Assumes eventual complete conversion to cassettes books, which are almost half the cost of disc books. Also assumes lifetime of a cassette book is 10 circulations.

## 6.0 RECOMMENDATIONS

In the implementation of Telebook service some things turned out to be unexpectedly difficult, or worse than expected. For those who might be involved in planning any future replications of Telebook, here then are the lessons we learned from such experience in the Columbus experiment:

1. Avoid installing Telebook on a cable system undergoing major changes, either technical, management, or financial.
2. Be sure you are close to opening date before announcing availability of service, such as occurred due to the simultaneous opening of Telebook service and Warner QUBE service.
3. Have readers, not operators initiate, by phone, requests to the cable company to visit their home for installation service.
4. Avoid using radios with "autodyne" mixer circuits.
5. Avoid last minute changes in software, unless vital, even if some desirable feature is lacking.
6. Provide special lightning surge protection to phone lines feeding digital semi-conductors.
7. If commercial FM equipment and modulation standards are used, count on 400 KHz minimum channel spacing.
8. A specially developed Telebook radio should utilize narrow bandwidth FM, adopted from public service technology to reduce channel spacing to about one tenth of that used in Columbus.
9. Prior to starting home installations, explain to the CATV management, and the installers, that some of the readers are partially sighted and quite visually mobile, but are still qualified for service.
10. Encourage Telebook operators to update reader cards during non-peak hours.

11. Be prepared to explain to CATV management anxious about "illegitimate freeloaders", that Telebook will always serve only a tiny percent of the population, and only a small percent of them will cheat the firm for free TV signals. Also that the free provision of FM service only does not violate the terms of their franchise contract to treat all customers equally in terms of charges for normal TV signals.

12. Develop a slightly modified logger-rewind device that does not depend on a given optical density of cassette tape leader.

13. Train an operator to repair damaged cassette tapes, perhaps during the midnight shift, as opposed to hiring outsiders to do same.

14. Remember that the local telephone company might also be prone to human error, especially for seldom requested services. Allow plenty of time for them to debug their installation, and billing procedure.

While lessons learned from negative experiences perhaps make for more interesting reading, just as many things went better than expected. Here is a partial list of those, again for the planning benefit of any future implementers of Telebook, and again assuming our Columbus experience is a reliable guide. This documents how the project's adversities, and the extra effort and time they required, were counterbalanced by serendipity. To obtain maximum cost effectiveness in future Telebook installations, seek maximum use of:

15. both the existing automatic and semi-automatic Telebook system designs, as produced by their respective vendors (with only minor changes). They were found to be economical, of high technical quality and reliability; practical to use by both staff and readers, and have replication and operating costs competitive with conventional Talking Book distribution methods.

16. the local radio reading service, which in Columbus provided numerous "commercials" and interview shows to publicize Telebook to potential readers; announcement and recording of the readers' introductory

instruction session; technical assistance during installation; repair service for broken tapes; and transferring discs to tape for those books not properly transcribed.

17. the performance of the Telephone Pioneers of America. In Columbus their people provided for the replacement of any defective radios within 24 hours of a trouble call. They provide a qualified engineer to assist in the installation, and particularly in the debugging of difficult-to-trace initial troubles. As a result no local repairman had to be hired and trained.

18. the local library, which proved an unexpectedly wide scale resource. They provided us Telebook Center housing and office equipment, assistance in screening and interviewing staff applicants (very important) and other support services too numerous to mention.

19. the CATEL modulators and the cable systems. No failures occurred with either of these after initial debug.

20. a young student staff - which in our case - even during the blizzard of '78 in Columbus never closed the center for a minute.

21. the readers, who almost without fail, are courteous, patient and encouraging.

22. my Ohio colleague William McElhaney, without whom this experiment would have been much more difficult. His persistence, and growth, in the face of many obstacles, and his ability to hire and inspire an excellent staff were all truly exceptional, and beyond expectation.

23. a research effort currently underway to eliminate the need for cable for Telebook, called Spectraplex. This hardware allows up to 20 Telebook channels to be broadcast over the equivalent (SCA) of one radio reading service. Such a system would allow Telebook radios to be moved about in the home and used anywhere in the city or suburbs without the necessity of cable TV or any home installation visits.

24. the automatic Telebook system to serve small population groups of 50-200 readers; and the semi-automatic system to serve large population groups over 200 readers.

# APPENDIX I

## SEMI-AUTOMATIC TELEBOOK SYSTEM DESCRIPTION, OPERATING AND MAINTENANCE INSTRUCTIONS

Prepared by Panasonic, San Francisco, California

# INTRODUCTION

The telebook center equipment is designed to provide simultaneous transmission of up to 60 talking books over Cable TV lines. The system consists of Sanyo FT 406 cassette tape players modified to play two or four mono tracks at 15/16 I.P.S. Each cassette player is wired to transmit a background music signal. Each 12 volt power supply provides enough power for 20 players. The operator can monitor the quality and the volume of any cassette player via the headset monitor controls located at the bottom of the rack. This will enable the operator to control signal levels. Two specially designed outboard cassette rewind/logging devices are included for fast and accurate manipulation of the tapes.

This system is designed to provide a maximum of operator ease and control. Because it is the first of its kind, we have operated all cassettes simultaneously for over 200 hours during our testing procedures. Each unit, therefore, is tested and operational before leaving our San Francisco plant.

# OPERATION OF THE TELEBOOK SYSTEM

## CASSETTE SYSTEM

1. Power supply switches must be ON.

2. Determine which cable company services the customer.

3. Select a player connected to that cable company. Be certain that the player is not in use.

4. Set the music switch to ON. This operation activates the automatic background music function and music will play on the channel until a cassette is inserted into the player, after which the background music will automatically be cut off.

5. Select the requested cassette from the file. If the customer has been listening to the cassette, use the logging unit to bring the cassette to the desired place.

6. Insert the cassette, with the label facing UP, into the correct player until the cassette disappears and is locked into playing position. The direction indicator lamp and the track 1 lamp will both light and the cassette will start playing. If the player begins on the wrong track or the "end" indicator lamp is on, the player may be stepped through the sequence by repeatedly pushing the TRACK CHANGE/REWIND switch until track 1 is reached. Set the music switch to OFF.

7. Determine that the cassette is playing properly and that the gain is correct by using the SELECTIVE MONITORING PANEL. (see next section)

8. The gain or volume is increased or decreased with the volume control knob. Shifting this knob to the right will increase the sound while shifting to the left will decrease the sound.

9. The player will automatically shut-off when the end of the program is reached.

10. If the customer requests the program stopped, make a note in the customer's log of which track is being played and then stop the tape.

11. The cassette is stopped and ejected when the EJECT button is pushed as far as it will go.

12. FAST FORWARD function is obtained by pushing in fully the FAST WIND button on the right. To stop the fast forward function, push the REWIND button half-way. At the end of the tape, the player will automatically change direction and go to the next track.

13. REWIND function is obtained by pushing in fully the REWIND button on the left. To stop the rewind function, push the FAST FORWARD button half-way. When the beginning of the tape is reached, the unit will automatically re-start the program.

14. The player is equipped to play either two [illegible] tracks or four [illegible] tracks. The selector switch is located under the [illegible] control.

For two-track tapes, the switch is slid to the left and the two-track indicator light will come on. In this mode, the player will stop at the end of the second track and will turn itself OFF, thereby activating the END indicator light.

For four-track tapes, the switch is slid to the right and the player will stop and turn itself OFF after the fourth track has been completed. There is no four-track indicator light but the END indicator light will come on after the player stops.

15. If desired, the background music will come back on soon after the player has stopped. For this function, leave the music switch on. (see 10 above).

## SELECTIVE MONITORING PANEL

Proper setting of gain or volume is obtained by the use of the Selective Monitoring Panel. The operator plugs in the headset and adjusts the volume to a comfortable level via the HEADSET volume control knob. The operator then dials the selector switches to the LETTER and NUMBER corresponding to the location of the player to be monitored. Program quality should be observed as well as volume level.

The operator should use the VU Meter located on the Left panel to measure the volume level more accurately and to prevent over-driving the telephone lines and the FM Modulators. Normally, the VU Meter should read 0. If it registers in the RED, move the volume control on the selected player to the Left, thus reducing the volume. If the meter registers below -10, move the volume control on the selected player to the Right, thus increasing the volume. The player should be monitored for a brief time to determine volume fluctuations in the program material. The volume level should be adjusted for an average in the program material.

# REWIND/LOGGER INSTRUCTIONS

TO LOG: (Make entries in customer log)

1. Indicate which track was playing before removing the cassette from player. (Use TRACK INDICATOR LIGHTS).
2. Remove cassette from player.
3. Insert cassette into the logging unit. Cassette must be properly seated with its label facing UP.
4. Close lid.
5. Set ACTIVATION SWITCH to OFF.
6. Set FUNCTION SWITCH to LOG.
7. Set thumbwheel switch to 1. Reset counter.
8. Set ACTIVATION SWITCH to ON. (The cassette will run until it stops automatically at the end.)
9. If TRACKS 2 OR 4 were playing, record the number. If TRACKS 1 OR 3 were playing, subtract 100 from the number shown and then record the result.
10. Set the ACTIVATION SWITCH to OFF after the READY light appears.
11. Remove cassette and return it to the files.

TO SEARCH:

1. Insert cassette into the logging unit. Cassette must be properly seated with its label facing up.
2. Close lid.
3. Set ACTIVATION SWITCH to OFF.
4. Set FUNCTION SWITCH to SEARCH.
5. Reset counter to zero.
6. Set thumbwheel switch to number previously logged in the customer log.
7. Set ACTIVATION switch to ON. The logging unit will stop shortly after reaching the pre-set number. The additional numbers are not enough to worry about. When the cassette stops, it is ready to be played.
8. Set ACTIVATION switch to OFF after READY light appears.
9. Remove cassette and insert it into the selected player.

## MAINTENANCE HINTS

1. When not in use, remove the tape from the player.
2. The cassette case is made of high impact plastic and should not be exposed to heat exceeding 130° F, as this may result in

   d deforming.

   Also, the cassette should not be left in temeratures below 23°F, as this may result in brittle tape easily broken during playback. If the tape has been exposed to extreme cold, it should be allowed to warm up before playing.
3. Never place cassette tape in the vicinity of a strong magnetic field (such as electric motors, loudspeakers, TVs, radio sets or other electrical appliances), also avoid touching the surface of the tape, as this may result in erasure or distortion of the recording.
4. Tape cassette should be placed in plastic bags and stored in places that are not exposed to excessive heat (do not leave in sun), cold or humidity. Proper care will ensure longer tape life and more satisfactory performance.
5. Protect the set and the tape from moisture.
6. When replacing the fuse, make sure to use a new one of 3 amperes maximum rating. If fuse blows again, recheck wiring or have unit bench tested.
7. Clean the head and the capstan after every 50-80 hours of use, with a soft cloth or piece of head cleaner soaked cotton. See Fig. 1.

## INSTALLATION PROCEDURES

The 40 station Telebook system will be shipped in several parts. You should recieve the following items:

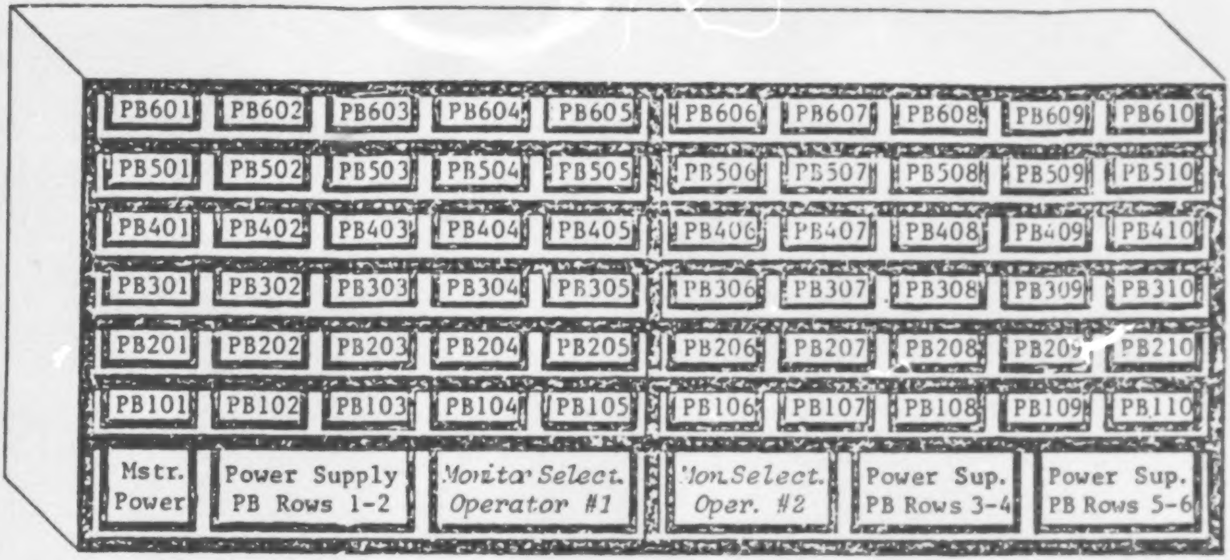
1. 40 Modified Sanyo FT 406 Cassette Player
2. 2 Rewind/Log Devices
3. 1 Large 30" X 80" Master Rack containing:
    - A. 40 slide in mounting brackets for cassettes
    - B. 3 12 volt power supplies
    - C. 2 Selective Monitoring Panels
4. 2 Headsets
5. 1 Table support for rack

WARNING - All units have been assembled and tested before shipping. Check for damage during shipping before you begin installation.

1. Unpack and set up special table.
2. Unpack rack and place it on table.
3. Unpack cassette players and inspect for damage. Install the units by inserting in premounted and wired brackets. No electrical wiring is necessary in installing the cassette units.
4. Plug in power supply cord. Turn on power supply and begin operating each unit. All units were pre-tested and have run a minimum of 200 hours.
5. Operate and test selective monitoring panel.
6. Unpack rewind/logger and inspect for damage.

instal. procedures con't.

7. The only required electrical connections are on the terminal screws directly behind each player. To hook up each cassette to transmission lines, you must wire them into a zero-level balanced input on the transmission equipment.
8. BACKGROUND MUSIC SYSTEM inputs are also terminal screws. It requires a low impedence unbalanced input.
9. The cassette rack has been designed for possible expansion of 20 more units. As much pre-wiring as can be done at the factory has been completed. However, the mounting brackets and more wiring will be necessary to complete the expansion. This can only be accomplished by a field representative coming out from the factory in San Francisco.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PB101
PB102
PB103
PB104
PB105
PB106
PB107
PB108
PB109
PB110
Mstr. Power
Power Supply PB Rows 1-2
Monitor Select. Operator #1
Mon.Select. Oper. #2
Power Sup. PB Rows 3-4
Power Sup. PB Rows 5-6

PLAYBACK UNIT HOUSING FOR CASSETTE TELEBOOK CENTER

*(Including Optional Monitor Selector Unit for Two Operators)*

HANSONIC-GARRETSON SOUND SERVICE
112 Moffitt Street - San Francisco, California 94131
(415) 334-4033 or 755-1916

# APPENDIX II

## AUTOMATIC TELEBOOK SYSTEM DESCRIPTION, OPERATING AND MAINTENANCE INSTRUCTIONS

# ATS

# AUTOMATIC TELEBOOK SYSTEM

## USER MANUAL

SUDBURY SYSTEMS INCORPORATED

80 Union Avenue, Box Q
Sudbury, Mass. 01776

(617) 443-3133

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## I SYSTEM DESCRIPTION

The Automatic Telebook System (ATS) allows multiple users to listen to multiple recorded tapes of books, magazines, music etc. from remote locations. The user requests a particular cassette tape from a human operator who places the cassette into the system. Once the cassette is assigned to that user the user may access the tape at any time and listen for varying periods of time to his recorded material without thereafter going through the human operator. The basic ATS provides for a total of 24 cassettes in use at one time. Several cassettes may be assigned to a single user and can be played in sequence if necessary. The user requests his recorded material over the telephone. A second telephone number is assigned to the ATS for the user to initiate and stop the tape playback. He listens to the tape over an FM radio connected to one of several cable FM channels assigned to the ATS. A system housekeeper attached to a keyboard printer will produce user statistics on the activity of cassettes, output channels and times of activity.

## II INSTALLATION

### A. Site preparation

The basic ATS requires a 120 VAC 60Hz, 20 ampere preferably noninterrupt line separately fused. The main cabinet requires about 50 square feet of well ventilated space. An RDV voice connecting arrangement (VCA) should be installed by the telephone company with its terminal strip close to the ATS equipment.

### B. Installation

The rear door of the RTAS cabinet should be opened with the key provided. On the bottom rear of the cabinet there is a hole through which wire enter and leave the cabinet. The following connections should be made:

1) The bottom tray, the power supply tray has on its left side as you face the rear of the cabinet a black and white wire which should be connected to a large 9 volt dry cell battery. The battery is used to provide about 1-2 hours of back up power to the system files in case of a power failure. The program is in PROM memory and does not need battery backup. The white wire is connected to the positive (+) battery terminal and the black wire is connected to the negative (-) battery terminal. There is room on the tray for the battery to stand upright. Rather than removing the drawer it is easier to install the battery by removing the cabinet panel on the left side as seen from the rear. This panel is removed by pulling up on the handhold.

2) The keyboard printer is connected to the 4 wire cable which should leave the cabinet through the bottom hole. The color coded cable wires should be connected as follows:

Green to the keyboard (+) side
Red to the keyboard (-) side
White to the printer (+) side
Black to the printer (-) side

The basic ATS will operate a keyboard printer at 300 baud. An option allows use of a 110 baud keyboard printer.

3) On the rear of the interface tray are two connector strips. The right hand (from the rear) strip contains 14 connectors. The basic ATS contains output interfaces for seven output channels however only four are connected in the basic system. These active four are numbered channel 4, 5, 6, and 7. Connections are made as follows:

output channel 4 connected to terminals 7 and 8
output channel 5 connected to terminals 9 and 10
output channel 6 connected to terminals 11 and 12
output channel 7 connected to terminals 13 and 14

4) The 12 connector terminal strip on the left (as seen from the rear) rear of the interface tray has connections for the RDV Bell system voice connecting arrangement. Wires should be connected from the RDV terminal box to the interface terminal as follows.

| Interface strip | RDV terminal signal | pin # |
|---|---|---|
| 1 | TR1 | 8 |
| 2 | RU1 | 7 |
| 3 | RNG | 12 |
| 4 | DISC | 16 |
| 5 | CY | 1 |
| 6 | | |
| 7 | | |
| 8 | CR | 3 |
| 9 | RI- | 11 |
| 10 | RI+ | 9 |
| 11 | RU2 | 6 |
| 12 | TR2 | 5 |

5) Insert the 120V line cord through the hole in the bottom of the cabinet and plug into a 120 Volt AC 20 amp outlet.

### C. Start up procedure

There are two key switches and a red button switch on the front of the power supply tray on the bottom of the front of the ATS cabinet. The keys to the key switches are located in the envelope taped to the inside of the rear door of the ATS cabinet. Insert the keys into the switches and turn the left switch to (ON). The red lights above the fuses to the right of the power supply tray front panel should all light. Now turn the right key switch to position (1) and while holding in position (1) press in the red button and then release the red button. Now release the key switch to the neutral position between (1) and (2). The red light above the red button should now be lit. If it is not lit, repeat the procedure of turning the key switch to position (1) holding while pressing the red button momentarily and then releasing the key switch. Position (2) is used similarly when restarting the program without clearing the files. Position (1) clears the files.

When the ATS program is first started you will hear clicking noises on the recorded message tray as the solenoids are engaged as part of the start up routine. After about 30 seconds these noises will stop and the system is initialized and ready for use.

Prerecorded messages have been recorded on cassettes which are inserted into recorders on the recorder tray. These cassettes can be removed by carefully sliding out the tray from the front of the ATS cabinet after removing the four screws on the front panel. The eject button is pressed and the cassette is removed. After rerecording on the cassette, the cassette is reinserted and the play button is engaged. The recorders will not work if the play button is not engaged. The cassettes used are specially prepared by Sudbury Systems Inc. without leaders. Regular commercially obtainable cassettes will not work properly. Additional cassettes can be ordered from SSI.

## III USER INSTRUCTIONS

### A) Requesting book

A touch tone dial telephone is necessary for the user to communicate with the Talkbook Center and the ATS. Two separate telephone numbers are assigned to the Talkbook Center and the ATS. The user telephones to the Talkbook Center and requests a book from the human operator. The user then supplies his own identifying number which may be up to seven digits, e.g. his home telephone number.

b) Beginning Listening Session. The user dials the telephone number assigned to the SCU. He then hears a dial tone and proceeds to dial in his user identifying number followed by pressing the # button on his touchtone dial. If he has correctly dialed in his user number a prerecorded tape will be heard instructing him on how to hear his book over his special FM receiver. If the SCU has detected an error in his user number a prerecorded message will inform him that he has made an error and that he should repeat the access procedure. If all the output channels are in use by other SCU users a prerecorded message will inform him of this and suggest that he try calling back in 15-20 minutes.

If the user has correctly dialed in his user number and an output channel is available the user will hear the instructions. He then hangs up the telephone and goes to his special FM receiver. He turns the tuning dial until he hears a distinctive attention-getting tone. The tone begins when he hangs up the telephone and lasts for 1 1/2 minutes. When the tone stops, the book will begin. Cassette tapes used in the SCU may have blank leaders at the beginning and end of each track up to several minutes in length. Therefore a silence of several minutes may occur at the beginning of a book and as the cassette is switched between tracks.

c) Ending Listening Session

When the user has finished a listening session he uses the same procedure to terminate the playing of the cassette as he used to begin the reading session. Merely turning off the special FM receiver does not stop the cassette. He dials the SCU telephone number, then his user identifying number followed by the # button. The book will stop and he may hang up his telephone. The next time he begins a listening session the book will start where he left off.

d) Returning Book to Circulation

When the listener finishes his book or is no longer interested in listening to the rest of his book, at a later time, he should telephone and inform the operator at the Talkbook Center so that the book can be made available to other users.

(4) TALKBOOK CENTER OPERATOR INSTRUCTIONS

a) Assigning Receivers

When a user calls the Talkbook Center requesting a book the operator types [illegible] on the keyboard printer and a list of unassigned receivers is printed. If unassigned receivers are available the operator types [illegible] and the printer will respond [illegible]. The operator then types the number of an unassigned receiver followed by a space. The printer responds with BOOK, the operator types the book number followed by a space and the printer replies CALLER. The operator then inserts the user identification number (up to seven digits), followed by a space. If the procedure has been done correctly the printer types DONE and terminates the line. If the procedure has been done incorrectly the printer will print a question mark/or a phrase indicating the difficulty (eg. NOT AVAILABLE if the recorpak has already been assigned to another user).

If the book is recorded on a four track cassette the operator inserts the book number. If the book is recorded on a two track cassette the operator types the book number, then a slash (/) followed by zero (0).

Some books will use more than one cassette (longer than 6 hours). The operator assigns the first cassette, then the second etc. in the order they are to be played. The ATS automatically links the cassettes so that they are played in the order in which they were assigned. The recorpaks however need not be in sequence but can be assigned at random. As long as the book number and caller number are identical the ATS will play them back in the order they were originally assigned.

A sample of assignments is shown below:

```
ASSIGN TAPE: 20   BOOK: 36   CALLER: 4437890   DONE
ASSIGN TAPE: 14   BOOK: 24   CALLER: 4433133   DONE
ASSIGN TAPE: 15   BOOK: 24   CALLER: 4433133   DONE
ASSIGN TAPE: 16   BOOK: 24   CALLER: 4433133   DONE
ASSIGN TAPE: 17   BOOK: 34/0   CALLER: 4439516   DONE
ASSIGN TAPE: 18   BOOK: 34/0   CALLER: 4439516   DONE
ASSIGN TAPE: 19   BOOK: 34/0   CALLER: 4439516   DONE
ASSIGN TAPE: 15  NOT AVAILABLE
```

After assigning a recorpak the appropriate cassette is inserted into the slot in the appropriate numbered recorpak (0-23) with the open side of the cassette facing toward the recorpak and away from the operator. The cassette is pushed until it clicks into place in the recorpak.

The assignment procedure is now complete.

## B. List of Active Recorpaks

By typing (1) the operator can at any time obtain file information on currently assigned recorpaks. See sample below:

```
LIST OF ACTIVE RECORPAKS
TAPE  STATUS   CALLER    TAPE ID  TRACK/TIME  ACC  LAST ACC   R/F LINKS
 12         X  1200000   12             1  03    0     0-00      /13
 13         X  1200000   12             1  00    0     0-00   12/
 14         X  4433133   24             1  04    1   IN USE      /15
 15         X  4433133   24             1  00    0     0-00   14/16
 16         X  4433133   24             1  00    0     0-00   15/
 17         X  4439516   34        0    1  00    0     0-00      /18
 18         X  4439516   34        0    1  00    0     0-00   17/19
 19         X  4439516   34        0    1  00    0     0-00   18/
 20         X  4437890   36             1  04    1   IN USE
 DONF
```

The first column (TAPE) lists the recorpak number. An X in the second column indicates that the recorpak has been assigned. The CALLER column has the users identification number. If this number is less than seven digits the ATS prints out additional zeroes after the number to make a total of seven digits even though the actual user number may have less than seven digits. The fourth column (TAPE ID) contains the book identifying number. All cassettes from the same book will have the same number. If the cassette is two track rather than four track then a zero will follow the book number. The next column (TRACK/TIME) lists the track the cassette is currently on and the total time in minutes that have been played on that track. The ACC column prints the number of times the user has listened to the book. The next column (LAST ACC) prints the time in days and hours (days-hours) since the last access. If the user is currently listening to the book this column prints IN USE. If a cassette is finished playing (i.e. has come to the end of the fourth track on a four track cassette or the second track of a two track cassette) this printout will print PLAYED in the LAST ACC column. If a book is longer than six hours and therefore requires more than one recorpak the last column (R/F LINKS) will identify the sequence in which the recorpaks were assigned and will be played back. For example in the above printout, recorpak 14 is linked forward to 15, recorpak 15 is linked reverse to 14 and forward to 16, and recorpak 16 is linked reverse to 15, therefore the recorpaks will play in sequence 14, 15 and then 16.

## C) Clearing Recorpak Assignments

When a user calls the telebook center to notify the operator that he has either finished a book or is no longer interested in listening to the end of a book the operator types (l) to get a listing of all active recorpaks. By examining this list the operator can find, from the book number and identifying number of the caller, which recorpaks are being used by that caller for his book. The operator then types (k) on the keyboard (i.e. abbreviation for "Kill") and enters the recorpak number to which the users book has been assigned, followed by carriage return. This clears the files concerning that recorpak and places that recorpak in the unassigned recorpak file. The operator now presses the eject button on the front of the recorpak. After the cassette pops out it can be removed and returned to the library for future assignment.

## D) System Commands and Files

The previous sections describe system commands and files for UNASSIGNED RECORPAKS (u), ASSIGN (a), LIST OF ACTIVE RECORPAKS (l) and KILL (k). In addition the operator has other commands and files at his disposal. Below are listed the available commands and files.

Type

a - To ASSIGN recorpaks - (see previous sections)

c - current CHANNEL ACTIVITY - channel zero (0) is the telephone channel to the ATS. When it is in use the printer will show OFF HOOK. When it is not currently in use the printer will type ON HOOK. If any of the output channels 1-7 are being currently used for listening the printer will type IN USE next to the number of the busy channel. If a channel is not in use the printer types IDLE. Since the basic ATS has only 4 available output channels 4,5,6 and 7, channels 1-3 will always print out IDLE.

d - DISABLE - If for any reason the operator or the user notice a malfunction in a recorpak that recorpak can be put out of use and made unassignable by the operator. The operator types (d) followed by the recorpak number and carriage return. * will appear in status on printout.

e - ENABLE - if the operator wishes to reenable a disabled recorpak, eg. after it is fixed, he types (e) followed by the recorpak number and carriage return. The recorpak can now be assigned.

k - KILL - see previous sections

l - LIST OF ACTIVE RECORPAKS - See previous sections. The operator by looking at LAST ACC column can note frequency of usage. If a recorpak has not been used for more than a specified length of time (eg. 10 days) he may wish to call the user to find out whether the user is no longer interested in the book and if the recorpak can be reassigned to another user.

p - PLAYED BOOKS - This print out lists the active recorpaks which have cassettes which have reached the end of the fourth track (or second track in two track cassettes). By looking at this listing the operator can KILL those recorpak assignments to make recorpaks available for new assignments.

s - STATUS - The operator types (s) followed by the recorpak number and a space. The printer then types the file on that recorpak only, with column headings as in an (l) print out.

t - TIME-SORT OF ACTIVE RECORPAKS - This print out is similar to an (l) print out however the recorpaks instead of being in numerical order are listed with the most recently accessed first.

u - UNASSIGNED RECORPAKS - see previous sections

x - DISABLED RECORPAKS - this file lists the recorpaks which the operator has marked as disabled.

: - DATE (MMDD) TIME (HHMM) - by typing colon the operator can enter the date and time which is used in the log explained below. The operator types (:) and the printer responds with DATE. The operator then enters two digits for the month followed by two digits for the day. If the month and/or day have only one digit a zero is inserted before the month and/or day to make these 2 digits. eg. February 8 would be typed as 0208. The space bar is depressed and the printer responds with TIME. The operator then enters two digits for the hour and two digits for the minutes. Here again zeroes are used in front of the hour or minute single digits. For example 8:04 A.M. would be entered as 0804. PM hours are entered as 13 through 24. For example 5:09 P.M. would be entered as 1709. The calendar clock is not accurate enough for timing more than a day at a time and therefore the (:) entry should be done every day if possible.

; - ACTIVITY SINCE LAST REPORT - The ATS keeps a log of all transactions of the system. Below is a sample (;) printout.

```
02/18  16:29
THE FOLLOWING ACTIVITY HAS OCCURED SINCE LAST REPORT

 DATE   TIME OF    CALLER    BOOK ID    MINUTES
        HANG-UP                         CONNECTED

02/18    16:28    4433133    24             11
02/18    16:28    4437890    36             10

TOTAL ACCESSES:   00
TOTAL REFUSALS:   00
 DONE
```

The date and time are printed first. Below this are listed all the user connections to ATS since the last (;) request. The date of the listening session, the time the user finished the session, the users identifying number, the book number and the total time that the user listened to the book at that session are printed. The log also prints the TOTAL ACCESSES or the number of user listening sessions that have taken place since the last (;) request. Also the TOTAL REFUSALS are printed indicating the number of times all output lines were busy since the last (;) request. A (;) printout should probably be obtained daily before entering the date and time after typing (:).

# APPENDIX III

## TELEBOOK STAFF JOB DESCRIPTIONS

# JOB DESCRIPTION

## TELEBOOK CENTER SUPERVISOR

### Function

The Supervisor of the Telebook Center will be responsible for all day to day operations of the Center, which will likely serve more than a hundred handicapped people daily. Duties include the recruiting, training, and supervision of Telebook operators; responsibility for the character of daily contact with readers; such as answering questions, reinstructing them in the use of the system, designing and redesigning service protocols and operating procedures of the center, and handling all manner of daily problems that may arise. The Supervisor will interact with the Columbus and Franklin County Library staff, the Cleveland Regional Library, the Ohio Rehabilitation Services Commission, CATV companies, and the Principal Investigator and Director of the Telebook project, K. J. Stetten of The MITRE Corporation.

### Personal Qualities

The ability to communicate well verbally, is vital. So is the ability to interact skillfully and pleasantly with many kinds of people. It is important for the supervisor to be rational, orderly, and cool under pressure. Motivation to provide a reliable, useful, and responsive service to the handicapped users of Telebook service should be evident.

### Background Requirements

A college degree in communication or library sciences is highly desirable. A minimum of three years experience in a related field is required to satisfy this position. It is believed the necessary knowledge in either of these areas might be acquired on the job, but not both. Ideally, experience is desired, but not absolutely required, either with one of the participating institutions, or in dealing with the handicapped -- or the reading materials they use. This will give the Telebook Center Supervisor a good background to assist in the design of the procedures to be used in the Center, to solve readers' problems, and to serve the needs of the various cooperating organizations.

### Job Duration

This position is funded for six months. It is anticipated that at least part-time effort will be required beginning approximately September 1 and full-time approximately September 15. Wages are expected to be in the range of $5 - $7 per hour, depending on qualifications and experience. This job will end March 31, 1978. There is a possibility that the position and the Telebook Center could continue beyond this date -- but only if some satisfactory funding arrangements are continued. Such cannot be assured. Much, of course, depends on the perceived success of the experiment by the assisting organizations -- including the Library of Congress.

# JOB DESCRIPTION

## TELEBOOK OPERATORS

Telebook Operators will be direct providers of Talking Book service to blind and physically handicapped people in Columbus and Franklin County. Their duties include answering telephone requests for a particular recorded book to be played; answering requests for a review of what books are in the Telebook library for categories of literature of interest to a reader; retrieval from the Telebook library of the requested material, starting the playback of the recording at the appropriate place and assuring that the reader is receiving the correct material. The Telebook operator keeps a log of each reader's use, that is including start time, stop time, and book read. Also the operator returns the finished books to their proper file place on the shelf.

Performing these operations involves working with a telephone headset, special playback equipment, monitoring equipment, and digital indexing equipment. At certain times of the day, the operator will likely be very busy, serving up to 20 readers simultaneously.

Telebook services will be provided around the clock every day of the week. We anticipate two operators will be needed on duty during the day and evening and one operator during the midnight to morning hours. The amount of hours worked by an individual during the week and the arrangement of shifts is left open, to accommodate the job market and the desires of the interviewee, and the arrangements perceived best by the Telebook Center Supervisor.

### Personal Qualities

A desire to serve the handicapped is important. Some of our readers will require patience on the part of the operator, but intangible rewards to the operator are large. The ability to think in an orderly way and be cool under pressure is important. A friendly telephone manner is more important than any particular speaking ability. The most important requirement is reliability: in attendance; in prior notification of the Supervisor if attendance will not be possible; and reliability in correctly handling the recorded materials and readers. Age and experience are not very relevant, but an interest in, and some familirarity with, books and literature is desired.

### Duration

This position is funded for 5-6 months. It is anticipated that the Telebook Center will open initially sometime during the first two weeks of October. The job will end March 31, 1978. There is a possibility that this job and the Telebook Center could continue beyond this date if funding arrangements continue, but such an arrangement cannot be assured. Much, of course, depends on the perceived success of the experiment by the readers and a number of organizations including the Library of Congress.

### Salary

Salary is expected to be $2.50 - $2.75 per hour with a possible increase after three months.

# APPENDIX IV

# READER'S INTRODUCTION TO TELEBOOK OPERATION

# INTRODUCTION TO TELEBOOK

Welcome to Telebook Service—a new and experimental Talking Book system for the blind and physically handicapped. This trial of Telebook is sponsored by the Library of Congress; but required the cooperation of the Cleveland Public Library, the Columbus and Franklin County Public Library, and your local cable television company.

Telebook will give you *immediate* reading in most books listed in Talking Book Topics, starting with 1977 May-June issue, within a few minutes of your telephone call—24 hours a day—every day. This announcement gives you a short introduction to this new service—so that you may take maximum advantage of its features. Telebook Service is free of any charge. Also, you do not give up your present services from the Cleveland Library to participate in this trial of Telebook—although you may later want to temporarily halt automatic book delivery, if you have such, and prefer Telebook.

You may read as long or as short a time as you wish. You can stop or restart reading any book as many times a day as you wish. (We automatically keep track of where you left off—don't worry about it.) You may have as many books underway at any time as you wish. You do not have to finish reading any book. You may browse through the beginning of as many books as you wish—before selecting those to read at length. In other words, you are the boss. We are here to serve you.

At any time of day or night if you have already selected from Talking Book Topics what you wish to read, just dial the special number embossed on the side of the radio. It is 224-1225. Tell the operator your name, and give the operator the title, or RD or RC number or otherwise identify the book you desire. We shall make a note on your index card of your selection or selections, and also where you end up reading for that session—so that when you next call, we can easily start you reading where you left off. When you call back to start reading again—just identify yourself—and we will directly have you reading in the last book you were reading, assuming that is what you wish.

If you wish the operator to read you a list of recent acquisitions under some category—either by authors name, or subject—such as biography, gothic novel or whatever, just ask the operator, who will also be glad to read you the short summaries of such books.

After each of your telephone calls requesting a book to be played, we give you time to get to your radio and to tune it to the appropriate place on the dial (use FM only for this service—it is the relatively quiet band)—before we start your book. An important point to understand is that each time you call for service it is likely that we will assign you a new position on the dial to tune to. Each station on the dial is used many times during the day to serve other readers as well. You will be assigned a currently unused channel when you call. Now, how do you find what frequency on the dial to tune to?

The operator will tell you to tune until you hear either classical music, or rock music, she will designate one or the other. We play this music, for a few minutes only, immediately before starting your book, so that you may find your channel. It will be the only such music on the dial.

Please tune your radio within a few minutes for the appropriate category of music. Your particular operator can also play this music over the telephone—especially during your first trials (also if you are ever on hold on the telephone). When you find your music, you are

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properly tuned and your book selection will start shortly thereafter. This same music is later used to position other readers at other places on the dial every few minutes. So please tune to your assigned music promptly. If any confusion or malfunction arises, whether your fault or ours, just call back the operator—identify yourself and the trouble will quickly be straightened out.

Occasionally, the operator might be too busy to answer immediately. Give him or her a little time. Or they may put you on hold for a short time, or you may hear a busy signal when you phone—just call back in a minute and chances are that you will get through, we have many lines.

It may happen at certain times of day that all the channels on your particular cable television will be busy serving other Telebook readers. In that case the operator will tell you so, and call *you* back, probably within 10 minutes, to say she is ready to start your reading. If you don't understand or remember all these instructions, don't worry, it is simpler than it sounds—and the operator will make it all work out anyway.

But one important point. Please call back the operator when you are finished reading. We have no other way to know when you stop listening. . . and thus cannot know where to start you at your next session. It's the same situation as if you fall asleep while listening to your home player. If this does happen however, the operator will work with you to find an approximate starting place.

At the end of each cassette and record side there will be an automatic pause of three minutes or so. You may wait—or go to the refrigerator, or whatever, during this pause. No action on your part is necessary for the playing to continue—eventually to the end of the book.

Bear with us if all does not go smoothly at first. We will also be learning. This system is the first of its kind using advanced equipment. If your radio or cable seems to be defective—just call our Telebook operator—please do not bother the cable television company. Your radio will be replaced or repaired—in your home—within 24 hours by a Telephone Pioneer.

Some months from now we shall be calling you to hear your reaction to Telebook. The survey of your reaction will be a factor in determining whether this service might become permanent. We hope you enjoy Telebook, and thank you for participating in this important experiment.

Would you now please call back the Telebook operator at 224-1225. Tell the operator your name, and that you are finished listening with the introduction tape. Give the operator any questions or comments you may have—and then *please* try a recent Talking Book—even if only for a short time—so that you will experience, first-hand, what the Telebook System of Talking Book delivery can do for you.

# APPENDIX V

# READER RECRUITMENT LETTER

## PARTICIPANTS WANTED FOR EXPERIMENT IN INSTANT DELIVERY OF TALKING BOOKS

Imagine having a small, special radio in your home that will allow you to read your own selections—*from any recent or current issue of Talking Book Topics*—at your own pace, any time of day or night. Even the latest and most popular books on either disc or cassette would be available instantly. A telephone call to our Telebook Center in Columbus—which can be reached toll free—will cause an operator to initiate, stop, or resume the playing of any of your selections. The operators will keep track of where you left off in each of the books you are reading, and automatically start you at the right place when you resume reading. They can also assist you in sampling new recordings to pick what book or books you might wish to read entirely. The operators will also, if you request, inform you what books are in the Telebook library in categories of interest to you.

This new service will be available, starting this October, to any person in Franklin County qualified to receive the usual Talking Book service, and who resides in an area in which cable television service is available. Telebook is an experiment sponsored by the Library of Congress for a duration of about six months.

If the experiment is successful, consideration will be given to maintaining and expanding the service. The success or failure of the experiment will largely be determined by your use, and reactions, to the service. For a meaningful evaluation of Telebook we hope at least half of our present Franklin County readers will choose to participate in the experiment. We also hope you will be patient with any potential start-up problems until all is working smoothly. (A group of approximately 100 readers in Washington, D.C. successfully used a preliminary version of the system a year ago.). During the experiment all normal Talking Book services will still be available for you to any extent you find them necessary.

Of course, there will be no charge for Telebook service. It will be arranged for the special radio to be delivered and installed by a local cable television technician. It will be connected to the cable free of subscription cost, even if your home does not subscribe to the cable for television purposes. We are grateful to the cable companies in Columbus, Ohio, all of whom are cooperating in this experiment.

The Library of Congress hopes this new method of delivering Talking Books and cassettes, and eventually magazines will make the circulation of Talking Books quicker, more convenient and more responsive to your needs. This system also has the potential of yielding net savings on the costs of Talking Book ordering, storing, handling, mailing, and clerical work. We also hope Telebook will eliminate reader problems with playback machines and defective recordings.

If you think you might *possibly* be interested in trying this new service, just mail the enclosed, self-addressed, postage-free card—it's ready to mail with your name already on it. You will be telephoned this summer to allow a more detailed explanation on any questions you may have; and to then hear if you want to participate. If you desire further information right now, call The Ohio Rehabilitation Services Commission, Talking Book Program, (614) 466-4550.

The Cleveland Regional Library

Yes, I am interested in the Telebook program. I understand the Columbus and Franklin County Public Library will telephone me to answer in more detail any questions I may have regarding this new service, and to verify my decision to participate in a six month trial of electronic delivery of Talking Books to my home.

I understand that all regular Talking Book services I am now receiving can still be available to me at any time I should want them; that I may cease using Telebook at any time; and that no charges will ever be made to be for any aspect of Telebook's services and equipment, including the special cable television connections at my residence.

CLEVELAND PUBLIC LIBRARY
FOR THE
BLIND AND PHYSICALLY HANDICAPPED

March, 1978

Dear Franklin County Readers,

There is still time to take part in Telebook, a unique experiment going on in Franklin County. The Library of Congress has decided to extend the experiment for three months through June, 1978 and may continue it for an additional three months.

By dialing a central telephone number, Telebook readers can listen to talking book discs and cassettes without waiting for delivery through the mail. The recordings are brought directly into the home via cable television lines and a special FM receiver. Telebook, as all Library of Congress and Regional Library services, is completely free to the user.

After a few problems with the installation of the FM receivers, the experiment is now in full operation and running smoothly. Telebook readers can listen on their FM receivers to all the cassette books and most talking books from those listed in the May-June 1977 issue of Talking Book Topics to the present. Readers keep their records and tape players, and continue to receive materials from the Regional Library.

If you would like to take part in the experiment, simply call your cable television company and ask for the person listed below. If you are uncertain which is your cable company, ask your neighbor or call any of the companies and they will furnish the information.

| | | |
|---|---|---|
| All-American Cable Company | Helen Mallin | 443-0114 |
| Co-Axial Cable Company | Cindy Morehart | 236-8698 |
| Warner Cable Company | Barbara Dohnert | 486-3613 |

If you are not now a Telebook reader, I hope you will decide to become one.

Sincerely,

Robert W. H. Vokes
Regional Librarian for the
Blind and Physically Handicapped

# APPENDIX VI

# READER SURVEY QUESTIONNAIRE

(Prepared by Library of Congress)

## TILLAMOOK PARTICIPANT IDENTIFICATION MASTER SHEET

| Participant Code Number | Participant Name |
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| 004 | |
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| Participant Code Number | Participant Name |
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| Fertilizer Code Number | Fertilizer Name |
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| Participant Code Number | Participant Name |
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| Participant Code Number | Participant Name |
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| Participant Code Number | Participant Name |
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# TELEBOOK USER QUESTIONNAIRE
June 1978

INSTRUCTIONS TO INTERVIEWER: PLEASE READ THE FOLLOWING QUESTIONS EXACTLY AS WRITTEN TO TELEBOOK PARTICIPANTS, AND RECORD THEIR ANSWERS AND COMMENTS IN THE SPACES PROVIDED. THERE IS ALSO SPACE AT THE END OF THE QUESTIONNAIRE FOR YOUR COMMENTS ABOUT THE PERSON INTERVIEWED, THE WAY THE INTERVIEW PROGRESSED, ETC.

EACH PERSON MUST BE GIVEN AN INTERVIEW NUMBER. USE ALL THREE DIGITS, PLACING TWO ZEROS IN FRONT OF NUMBERS 1 TO 9, AND ONE ZERO IN FRONT OF NUMBERS 10 TO 99; FOR EXAMPLE, THE 23RD PERSON CALLED IS CODED 023. WRITE THIS NUMBER ON THE READER'S CARD, AND THE READER'S NAME ON THE MASTER SHEET. BY FOLLOWING THESE PROCEDURES, YOU ARE PROTECTING THE CONFIDENTIALITY OF THE READERS AND GUARANTEEING THAT ALL TELEBOOK PARTICIPANTS HAVE BEEN CALLED AND QUESTIONED.

A LIBRARY OF CONGRESS REPRESENTATIVE WILL SPOT-CHECK PARTICIPANTS FOR THEIR RESPONSES AND REACTIONS.

Hello, this is ________________________ from the Telebook Center. The Library of Congress has asked us to conduct a final survey of Telebook participants, and I'd like to know if you have a few minutes to answer our survey.

INTERVIEWER, PAUSE FOR ANSWER. IF HE SAYS NO, TRY TO SCHEDULE A TIME.

Thank you. Then I'll take your answers. Please feel free to give me any general comments about the experiment when we've finished the questions. By the way, we've assigned you a code number to protect your confidentiality.

__INSTRUCTIONS TO INTERVIEWER__: CIRCLE THE LETTER OR NUMBER PRECEDING THE ANSWER CHOSEN. WHERE COMMENTS ARE ASKED FOR, WRITE THEM IN THE SPACE PROVIDED IF THE RESPONDENT CARES TO MAKE ANY COMMENT; OTHERWISE WRITE "NO COMMENT."

NOTE: MITRE CORPORATION APPENDS NUMBER OF RESPONSES GIVEN FOR EACH MULTIPLE CHOICE OPTION.

1. Now then, what age group are you in?
13 (a) Under 15
17 (b) 15-24
30 (c) 25-39
40 (d) 40-54
25 (e) 55-64
39 (f) 65 and Over

2. Are you: (a) Female? (b) Male?
86 48

3. What is the highest education level you completed?
19 (a) Elementary School
17 (b) Junior High School
164 (c) High School
44 (d) Two to four years of College
19 (e) Graduate or Professional School

4. Are you a full- or part-time student?
37 (a) Yes
176 (b) No

5. What is your present employment status?
38 (a) Employed full-time
3 (b) Employed part-time
25 (c) Unemployed
50 (d) Retired
31 (e) Homemaker
21 (f) Still in school

6. What type of handicap is the basis for your participation in the Library of Congress reading program?
]120 (a) Totally or Legally Blind
20 (b) Visually Handicapped but Not Legally Blind
21 (c) Physically Handicapped
6 (d) Learning Disabled

7. How long have you had the handicap?
20 (a) 5 years or less
26 (b) 6-10 years
4 (c) 11-15 years
3 (d) 16-20 years
16 (e) Over 20 years
171(f) From birth

8. How did the cable TV company contact you to arrange for installation of the Telebook receiver?

119 (a) By telephone
27 (b) By letter
3 (c) In person just to make an appointment
14 (d) In person to install the receiver
0 (e) Never contacted, never had a Telebook receiver

INSTRUCTIONS TO INTERVIEWER: IF ANSWER IS (e), TERMINATE INTERVIEW WITH AN APPROPRIATE THANK YOU.

9. How did you receive instruction in the use of Telebook? Any or all of the following?

60 (a) I called the Telebook operator.
27 (b) The Telebook operator called me.
67 (c) The Telebook operator played the instruction tape.
3 (d) At my request the operator played the tape a second time.
33 (e) The operator answered my questions.
100 (f) The installer instructed me.
5 (g) I never received instruction because I did not need it.
0 (h) I never received instruction but I needed it.

10. Which was your favorite time of day to use Telebook?

16 (a) Between 6 a.m. and noon
25 (b) Between noon and 6 p.m.
70 (c) Between 6 p.m. and midnight
6 (d) Between midnight and 6 a.m.
35 (e) No preference.

11. Besides ordering books from the Telebook Center, did you ever tune in on other books played over the Telebook radio?

65 (a) Yes
70 (b) No

If "Yes," (c) Did you ask for a book after such listening? 0
30 (d) Yes
44 (e) No

If "Yes," (f) Can you name books you selected this way?

______________________________________________

______________________________________________

12. Do you have a Library of Congress talking book phonograph player?

145 (a) Yes
16 (b) No

13. Do you have a Library of Congress talking book cassette player?

103 (a) Yes
57 (b) No

INSTRUCTIONS TO INTERVIEWER: IF RESPONDENT ANSWERED "NO" TO EITHER 12 OR 13, SKIP TO QUESTION 15. IF THE RESPONDENT ANSWERED "NO" TO BOTH 12 AND 13, SKIP TO QUESTION 17 or 18.

14. If you have both kinds of player, do you normally use:
32 (a) the phonograph player more?
22 (b) the cassette player more?
43 (c) both players about equally?

15. While participating in the Telebook project, did you use the talking book equipment you described above?
179 (a) Yes
15 (b) No

If "Yes," (c) did you use it for:

[INTERVIEWER, MARK ALL APPROPRIATE ANSWERS]

9 (1) listening to magazines only?
85 (2) listening to both magazines and books?
42 (3) listening to books only?
9 (4) listening to books and/or magazines not available from the regional library?
15 (5) listening to books not available through Telebook?

16. Please rate Telebook service and your usual talking book service as follows:

[INTERVIEWER, MARK APPROPRIATE ANSWERS]

(a) The sound quality is best on the:
75 (1) Telebook radio
39 (2) cassette player
71 (3) phonograph

(b) Operation of controls is easier with the:
39 (1) cassette player
53 (2) phonograph player
88 (3) Telebook radio

(c) Preferred books were most readily available for use on the:
56 (1) phonograph
89 (2) Telebook radio
30 (3) cassette player

(d) Total talking book needs during participation in the experiment were best met by the:
68 (1) Telebook radio
34 (2) cassette player
52 (3) phonograph

FOR USERS OF SEMI-AUTOMATIC SYSTEM:

17. When you dialed the Telebook Center number:

[INTERVIEWER, MARK ALL APPROPRIATE ANSWERS]

(a) how often did you receive a busy signal?
16 (1) Frequently
0 (2) Usually
12 (3) Sometimes
78 (4) Seldom

(b) when you received a busy signal, was it when you wished to:
58 (1) start or continue a book?
30 (2) stop a book?
7 (3) obtain information from the operator?

(c) was the book you wished to read available from Telebook?
41 (1) Always
39 (2) Usually
16 (3) Occasionally
13 (4) Never

(d) how often did you have to wait to listen to the book?
1 (1) Frequently
20 (2) Occasionally
86 (3) Never

(e) if you had to wait, about how soon did the operator call you back (number of minutes)?

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(f) when you called the Telebook Center, was it:

[INTERVIEWER, MARK ALL APPROPRIATE ANSWERS]
110 (1) to start or continue a book
108 (2) to stop a book
46 (3) to order a book from the current Talking Book Topics issue?
35 (4) to order a book from an older Talking Book Topics issue?
84 (5) to ask the operator to read off titles?
87 (6) to ask the operator to read titles in a specific subject area?
29 (7) to report a problem with the Telebook equipment?

(g) how often did you ask for books not available in the Telebook collection?
9 (1) Frequently
20 (2) Occasionally
0 (3) Can you name books?

________________________________________
75 (4) Seldom

FOR USERS OF AUTOMATIC SYSTEM:

16. Please rate the automatic Telebook system:

(a) The touch-tone procedures for use in the automatic system [illegible]e:

[INTERVIEWER, MARK ALL APPROPRIATE ANSWERS]

10 (1) e[illegible] to learn
1 (2) [illegible]lt to learn
7 (3) [illegible]o use
1 (4) [illegible]cult to use
3 (5) [illegible] most of the time, that is, started or stopped [illegible]e book
6 (6) worked only some of the time
0 (7) other comments

________________________________________

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(b) Have you had a touch-tone telephone before?
5 (1) Yes
7 (2) No

(c) As far as you could tell, did the automatic reverse work so that you could listen to two cassette sides without operator assistance?
7 (1) Yes
5 (2) No

(d) As far as you could tell, did the system switch easily to a new cassette when necessary?
8 (1) Yes
3 (2) No
0 (3) Any additional comments.

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________________________________________

________________________________________

(e) When you wished to begin a new book:
11 (1) you usually called the Telebook Center.
0 (2) a Telebook operator usually called you.
1 (3) sometimes you called, sometimes they called.

(f) When you called the Telebook operator, how often did you receive a busy signal?
0 (1) Frequently
7 (2) Occasionally
5 (3) Never

(g) Was the book you wished to read available from Telebook?
8 (1) Always
1 (2) Usually
2 (3) Occasionally
1 (4) Never

(h) If the books were in the Telebook collection, about how long did you have to wait before you could listen to them on the automatic system? Either:
7 (1) Number of hours ______________
OR
3 (2) Number of days ______________

(i) When you called the Telebook Center, was it:

[INTERVIEWER, MARK ALL APPROPRIATE ANSWERS]

5 (1) to order a book from the current *Talking Book Topics* issue?
3 (2) to order a book from an older *Talking Book Topics* issue?
7 (3) to ask the operator to read off titles?
5 (4) to ask the operator to read titles in a special subject area?
9 (5) to report a problem with the Telebook equipment?

(j) How often did you ask for books not available in the Telebook collection?
1 (1) Frequently
3 (2) Occasionally
0 (3) Can you name some.

____________________________________________
6 (4) Seldom

### FOR ALL USERS

19. Finally, please give your general rating of audio equipment.
(a) Of the equipment used, which do you like best? Rank them [INTERVIEWER, READ LIST AND NOTE RANKING] in order with one (1) as the favorite.

Number giving as first choice:

48 cassette player from LC
31 cassette player (personal)
34 phonograph from LC
2 phonograph (personal)
3 radio reading service receiver
13 Telebook radio
8 Television (personal)

(b) What is your reason for the one you ranked:
(1) first?

________________________________________________

________________________________________________

(2) second?

________________________________________________

________________________________________________

(3) last?

________________________________________________

________________________________________________

20. Do you have any additional comments?

________________________________________________

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________________________________________________

Thank you so very much for answering these questions. The Library of Congress will give you a report of the findings of this test of Telebook. We appreciate your participation.

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## INTERVIEWER RATING

NOTE TO INTERVIEWER: THE LIBRARY OF CONGRESS THANKS YOU FOR YOUR PARTICIPATION IN [illegible] AND YOUR HELP IN OBTAINING INFORMATION FROM [illegible] USERS. PLEASE GIVE YOUR RATINGS OF THE INTERVIEW BELOW.

1. How many times did you call the respondent before you reached him?

______________

2. What time of day did you conduct the interview?
   (a) Between 6 a.m. and noon
   (b) Between 12 noon and 6 p.m.
   (c) Between 6 p.m. and midnight
   (d) Between 12 midnight and 6 a.m.

3. Did you conduct the interview at the time noted above because:
   (a) It was the most convenient time for the respondent?
   (b) It was the most convenient time for you because of the [illegible] Center workload?
   (c) It was convenient for both of you?
   (d). The time you tried happened to be right?

4. Was the interview conducted without interruption?
   (a) Yes
   (b) No
   (c) About how many times were you interrupted?______________

5. Would you say that the respondent was:
   (a) enthusiastic about answering the survey?
   (b) generally cooperative?
   (c) only mildly interested?
   (d) generally hostile but cooperative?
   (e) generally uncooperative?

6. Would you say that the respondent was:
   (a) enthusiastic about [illegible]?
   (b) generally interested?
   (c) only mildly interested?
   (d) generally indifferent?

7. The respondent [MARK ALL APPROPRIATE ANSWERS]:
   (a) seemed to understand most or all of the questions.
   (b) appeared to understand but gave some inappropriate answers.
   (c) had difficulty in understanding some questions but with your assistance eventually appeared to understand and gave appropriate answers.
   (d) had great difficulty understanding and often gave inappropriate answers.

[illegible]

8. How do you feel about working with handicapped persons?

______________________________________________________________

______________________________________________________________

9. Have you met personally any [illegible] participants?
(a) Yes
(b) About how many? ____________
(c) No

10. Have you:
(a) met any handicapped person before [illegible]?
(1) Yes
(2) No
(b) worked with any handicapped person before [illegible]?
(1) Yes
(2) No

11. Do you have any particular comment about the [illegible] experience?

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

Again, thank you for your help. Please be sure that you have recorded the identification number from the master sheet on the reader's card on this form, and the reader's name on the master sheet. Then give the completed survey form to the [illegible] Center Supervisor.

# APPENDIX VII

# FRENCH COMPREHENSION MATERIAL

B-12 Columbus Dispatch F THURS., DEC. 1, 1977

# Blind Get Talking Books

"Talking books" will be instantly available to the blind and handicapped in a program initiated Thursday at the Public Library of Columbus and Franklin County. The new Telebook service was explained by the inventor, Ken Stretten of the Mitre Corp. of McLean, Va., at left, and Kurt Cylke, at right, of the Library of Congress which is funding the six-month test of the service. Irwin Hott of 1540 Northridge Rd. dials the station which will bring the recorded book by telephone, using cable television lines. The specially modified FM radio receivers will be loaned to 600 subscribers, and connected at no charge to the television cable system. Anyone interested may contact the public library's Telebook service. (Dispatch Photo by Bob Rhees)

**"TALKING BOOK" MACHINE** — William McElhoney (left), supervisor of the Public Library of Columbus and Franklin County's Telebook program, and Richard Berry of the Telephone Pioneers of America, check the new automated system that will allow small libraries to provide blind persons with "talking books" in their homes. Readers will receive the talking books over special FM receivers. The system, linked to user homes by the county's three major cable television lines, will be tested through June in the Columbus area. (C-J Photo by Hank Reichard)

# Columbus blind to 'read' via cable TV, radio

COLUMBUS (AP) — Books will talk to the blind in their homes through a new system to be tested in Columbus beginning Thursday.

The system allows blind persons to browse through the list of popular readings of the Columbus and Franklin County libraries, make a selection, and have it read to them at home via cable television and special FM radio hookups.

Telebook is a joint effort of the Library of Congress, the McLean, Va.-based MITRE Corp., the Columbus library and others.

"It will employ the Columbus area's highly developed network of cable television lines in what is described as the first operation of its kind to make reading materials instantly available to the blind and handicapped in their homes.

Blind persons — both adults and children — who qualify for the existing Library of Congress Talking Books program and who live in the areas served by the three cable companies operating here will be provided free home hookups to the cable lines.

A specially modified FM radio receiver will also be provided, library officials said. Sound signals will travel on telephone lines to cable lines and will be heard on the FM receivers.

The subscribers will be able to call the Telebook Center 24 hours a day and request that a book be played for them. They can ask what new titles are available, or they can hear the first few pages of unfamiliar titles.

"In other words, Telebook readers will have an equivalent to browsing the local library's paperback book rack," said MITRE physicist Ken Stetten.

Subscribers will have a choice of 600 readings from the current Talking Book list. Library officials say some of the titles take up to two years to obtain at home. The delays are caused by high demand for some titles and the fact they have to travel to and from subscribers by mail.

Stetten, iventor of the experimental system, said the tape library will double within six months and will be updated with new titles every two months.

CLEVELAND PLAIN DEALER

Nov. 27, 1977

4 THE NORTHWEST NEWS WEDNESDAY, NOVEMBER 30, 1977

# 'Talking Book' A New Service To Be Offered By Library

Donald Curran, assistant librarian of Congress, will join with officials of the Public Library of Columbus and Franklin Co. and the MITRE Corp. Thursday, Dec. 1, to officially initiate a new, experimental service offering "Talking Book" reading materials to the blind and physically handicapped of Franklin County.

Called "Telebook," the project is the only program in operation in the United States which instantly brings recorded books and other reading materials into the homes of the blind and physically handicapped through the use of cable television (CATV) lines.

Telebook is being funded through a contract from the Library of Congress to the MITRE Corp with the support of the PLCFC, the Ohio Rehabilitation Services Commission, the State Library of Ohio, the Cleveland Public Library's Regional Library for the Blind and the Telephone Pioneers of America.

A Leonard Nusbaum, president of the PLCFC Board of Trustees, and library Director Don Sager will welcome Curran to the Main Library and will be joined by MITRE Corp physicist Ken Stetten, the inventor of Telebook, in a news conference at 11 a.m. on the second floor of the Main Library, 96 S. Grant Ave. Other officials of the Library of Congress, including Kurt Cylke, chief of the Division for the Blind and Physically Handicapped will attend.

During the news conference a demonstration of the Telebook system will be presented by Stetten. A tour of the Telebook Center, located in the lower level of Main Library will be conducted following the news conference by Telebook staff.

A reception sponsored by the MITRE Corp. will be held in the Biography, History & Travel Division on the second floor of Main Library, following the tours of the center.

According to Stetten, the PLCFC was selected for the large scale experimentation of the program because of the area is the third largest CATV market in the nation in terms of subscribers. The three CATV lines in the area may subscribe to Telebook. The project will provide a free home hook-up to the CATV line for the subscriber and will install a free specially-modified FM radio receiver in his or her home.

Any of hundreds of Telebook subscribers may call the Telebook Center number, any time of the day, any day of the week, and ask for the title of the book he wishes to hear. The Telebook operator will then ask the subscriber to listen for a designated type of music on his FM radio receiver. The subscriber will be given a few minutes to go to his radio, tune in the designated music, and his book selection will be heard from one of 40 special tape players at the Main Library. The subscriber may then listen for as long as his reading schedule permits.

Telebook operators will keep index cards with names of subscribers on file to record the name of the book the subscriber was reading and where he left off during his last reading period. A completely automated juke-box like system, intended for use in small communities, also will be tested with a portion of the Columbus Telebook readers.

The system also provides for browsing by the subscriber. Upon request, the operator will read off new titles or authors under topics of interest to the reader or can read short summaries of available selections.

The subscriber may also wish to hear the first few pages of a recorded book to determine if the tape is of interest. "In other words," Stetten said "Telebook readers will have an equivilant to browsing the local library's paperbook book rack."

Telebook has advantages in that it offers the blind and physically handicapped immediate access to the latest and most popular book titles which may take up to two years to obtain through the Talking Books mail distribution program, and offers the subscribers a relatively easy means of receiving the materials. Instead of using the mails to deliver recorded discs which must be ordered, delivered, and returned, Telebook is electronically delivering books almost instantly to participating readers within a few minutes of their telephone requests 24-hours a day.

Stetten, inventor and developer of the project, is associated with the METREK Division of the MITRE Corp, in McLean, Va., a large nonprofit systems engineering firm. He noted that the Main Library is connected by 35 special telephone lines to the three CATV stations in the county to provide an initial library of almost 600 tapes of the latest Talking Book selections from the Library of Congress. The collection, which will double in six months, will contain all new additions to the Library of Congress program listed bi-monthly in their existing catalog entitled "Talking Book Topics". Children's books are also available on the system which already has a number of young subscribers.

Stetten added that the ultimate costs of the program are expected to be less to administer than the current Talking Books program, "using technology to offer both a better system for the subscriber, and a less expensive system for the government," he said.

Others who have contributed to the Telebook program and who will attend the news conference include representatives of Central Ohio Radio Reading Service, American Council for the Blind, Telephone Pioneers of America, All American Cablevision, The State Library of Ohio, National Federation for the Blind, Coaxial Communications of Columbus, Inc., Cleveland Public Library and Warner/QUBE Communications.

A-2 Columbus Dispatch c SUN., NOV. 27, 1977

# Blind To Get Talking Books

By The Associated Press

Books will talk to the blind — in their homes — in a unique system to be tested in Columbus beginning Thursday.

The system allows blind persons to browse through the list of popular reading of the Columbus and Franklin County Library, make a selection, and have it read to them at home via cable television and special FM radio hookups.

**"TELEBOOK" IS** a joint effort of the Library of Congress, the McLean, Va. based MITRE, Corp., the Columbus library and others.

It will employ the Columbus-area's highly developed network of cable television lines in what is described as the first operation of its kind to make reading materials instantly available to the blind and handicapped in their homes.

Blind persons, both adult and children, who qualify for the existing Library of Congress "Talking Books" program and who live in the areas serviced by the three cable companies operating here will be provided free home hookups to the cable lines.

**A SPECIALLY** modified FM radio receiver will be provided, too, according to library officials. Sound signals will travel on telephone lines to cable lines and will be heard on the FM receivers.

The suberibers will be able to call the Telebook Center 24 hours a day and request a book be played for them. They can ask what new titles are available, or they can hear the first few pages of unfamiliar titles.

"In other words, Telebook readers will have an equivalent to browsing the local library's paperback book rack," said MITRE physicist Ken Stetten.

**PARTICIPANTS** will have a choice of 600 readings from the current Talking Book list. Library officials say some of the titles take up to two years to obtain at home.

Stetten predicted that the program, aside from its obvious advantage of allowing the blind to have a tape library at their fingertips, will be shown to cost less than the current Talking Book system.

Participants in the Columbus project are the Central Ohio Radio Reading Service, American Council for the Blind, Telephone Pioneers of America, All American Cablevision, The State Library of Ohio, National Federation for the Blind, Coaxial Communications of Columbus Inc., Cleveland Public Library and Warner-QUBE Communications.

TOLEDO BLADE

Nov. 27, 1977

SEC. A, PAGE 19

### *'Read' By TV-Radio Hookup*

# Unique System Offers 'Telebooks' To Blind

COLUMBUS (AP) — Books will talk to the blind — in their homes — in a unique system to be tested in Columbus beginning Thursday.

The system allows blind persons to browse through the list of popular books at the Columbus and Franklin County Library, make a selection, and have it read to them at home by cable television lines and special FM radio hookups.

"Telebook" is a joint effort of the Library of Congress, the McLean, Va.-based MITRE Corp., the Columbus Library, and others.

**Use Cable Television Network**

It will employ the Columbus area's network of cable television lines in what is described as the first operation of its kind to make reading materials instantly available to the blind and handicapped in their homes.

Blind persons, both adult and children, who qualify for the Library of Congress' "Talking books" program and who live in the areas served by the three cable companies operating here will be provided free home hookups.

A specially modified FM radio receiver will be provided, too, according to library officials. Sound signals will travel on telephone lines to cable lines and will be heard on the FM receivers.

**Have Choice of 600 Readings**

The subscribers will be able to call their requests to the Telebook Center 24 hours a day. They can ask what new titles are available, or they can hear the first few pages of unfamiliar titles.

Participants will have a choice of 600 readings from the Talking Book list.

Ken Stetten, a MITRE physicist and inventor of the experimental system, said the tape library will double within six months and will be updated with new titles every two months.

YOUNGSTOWN VINDICATOR

Nov. 27, 1977

# Blind Will Hear Books Via CATV

COLUMBUS, Ohio (AP) — Books will talk to the blind — in their homes — in a unique system to be tested in Columbus beginning Thursday.

The system allows blind persons to browse through the list of popular reading of the Columbus and Franklin County Library, make a selection, and have it read to them at home via cable television and special FM radio hookups.

"Telebook" is a joint effort of the Library of Congress, the McLean, Va.-based MITRE, Corp., the Columbus library and others.

It will employ the Columbus-area's highly developed network of cable television lines in what is described as the first operation of its kind to make reading materials instantly available to the blind and handicapped in their homes.

Blind persons, both adult and children, who qualify for the existing Library of Congress "Talking Books" program and who live in the areas serviced by the three cable companies operating here will be provided free home hookups to the cable lines.

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"In other words, Telebook readers will have an equivalent to browsing the local library's paperback book rack," said MITRE physicist Ken Stetten.

Participants will have a choice of 600 readings from the current Talking Book list. Library officials say some of the titles take up to two years to obtain at home. The delays are caused by high demand for some titles and the fact that they have to travel to and from subscribers by mail.

Stetten, inventor of the experimental system, said the tape library will double within six months and will be updated with new titles every two months.

He predicted that the program, aside from its obvious advantage of allowing the blind to have a tape library at their fingertips, will be shown to cost less than the current Talking Book system.

Participants in the Columbus project are the Central Ohio Radio Reading Service, American Council for the Blind, Telephone Pioneers of America, All American Cablevision, The State Library of Ohio, National Federation for the Blind, Coaxial Communications of Columbus, Inc., Cleveland Public Library and Warner-QUBE Communications.

# APPENDIX VIII

## EXCERPT
## FEDERAL COMMUNICATIONS COMMISSION ORDER
## REGARDING
## FREQUENCY CONSTRAINTS FOR CABLE TELEVISION SYSTEMS

# INTERIM FREQUENCY OFFSET CRITERIA

## 74.8-75.2 MHz

No Adjustment to Carrier Frequencies Required at this time.

## 108-118 and 328.6-335.4 MHz

CATV systems using frequencies in these bands within the service volume* of a VOR, ILS Localizer or ILS Glide Slope Facility must utilize carrier frequencies which are at least 50 kHz removed from the frequency used by the navigational facility providing service.

## 118-136, 225-328.6, and 335.4-399 MHz

CATV systems using frequencies in these bands within an Air Traffic Control Communications service volume** must utilize carrier frequencies which are at least 100 kHz removed from the frequency used by the communication facility providing this service.

## 108-136 and 225-399.9 MHz

In no case shall the level of field intensity exceed 10 µV/m in the useable aircraft flight environment.

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* Service volumes for navigation systems are defined in FAA Order 6050.5A March 12, 1969 (currently being revised).

** Service volumes for communications systems are defined in FAA Order 6050.4A June 3, 1965 (currently being revised).

# APPENDIX IX

## AN AGREEMENT IN PRINCIPLE BETWEEN CABLE CORPORATION OF COLUMBUS, OHIO AND THE MITRE CORPORATION OF MCLEAN, VIRGINIA

## AN AGREEMENT IN PRINCIPLE BETWEEN _____ CABLE CORPORATION OF [City], OHIO AND THE MITRE CORPORATION OF McLEAN, VIRGINIA

This document serves to confirm and define in principle an agreement between _____ Cable Corporation of [City], Ohio (hereinafter referred to as the Cable Corporation) and The MITRE Corporation of McLean, Virginia (sometimes called the Contractor) to cooperate in performing an experiment to test various aspects of the delivery of Talking Books and periodicals for the blind and physically handicapped contingent upon the Contractor obtaining Library of Congress funding to perform this experiment and Library of Congress approval to contract with the Cable Corporation. By joining in this agreement, the Cable Corporation also certifies to the Library of Congress a commitment to participate in the experiment as defined in the remainder of this document. It is anticipated that a formal contract confirming the agreement discussed in this document will be implemented upon Contractor receipt of funding and approval of such a subcontract as may be required by the terms of the prime contract between the Contractor and the Library of Congress. This agreement in principle does not obligate either party in any manner whatever to expend any funds.

The basic objective of the experiment is to measure the attractiveness and effectiveness of utilizing cable telecommunications as a means to deliver Talking Books and periodicals to blind and physically handicapped people in their homes or other locations utilizing special radio receivers supplied to them which will tune to a specially designated part of the spectrum. This experiment will seek to obtain information on the technical, economic, and institutional feasibility of wide-spread utilization of such a medium of delivery. The responsibility of obtaining this information is the Contractors, not the Cable Corporations. To implement the experiment, the Contractor will install and staff a [illegible] Center in the city of location of the Cable Corporation. This center will contain a library of recorded spoken books and periodicals, appropriate playback equipment, and other facilities necessary for the center's operation. It is possible, although not yet defined, that partial or fully automated equipment (i.e., remotely operated by the user over telephone lines) will be installed in the center. The users of this service will call a special telephone number to request reading material to be placed upon one of a number of playback devices, each of which transmits spoken voice audio signals to an FM modulator which sends signals throughout the cable system. All special hardware required for this experiment will be provided by the Contractor.

The Cable Corporation agrees to provide the use of their cable system, as defined in this document, to accomplish this experiment at no charge, in the interest of advancing the present knowledge about this new use of cable television. The Cable Corporation is free to publicize as it may choose, the fact that it is cooperating with and supporting this experiment, and may describe the nature of this experiment activity, provided however that the Library of Congress is given the opportunity of [prompt] prior approval of any formal disclosures, such as press releases or advertisements.

Due to the experimental nature of this program, it is impossible to define in detail all aspects of the experiment at this time. However, the following specific factors serve to define the bounds of the experiment and the commitment by the Cable Corporation to support it:

(1) Duration. The project is expected to start delivering service during the first half of 1977 and probably last for six months, and in any case to exceed 12 months duration of service. It is expected that 3 months before initiation of service equipment installation should begin.

(2) Forward Channels. The number of FM audio channels utilized will be a function of the number of users. For purposes of planning, it is believed that the number of channels will not exceed 1/10th of the number of active users. For example, for a system passing 50,000 homes (or approximately 175,000 population), 175 users, maximum, are expected. Thus, no more than approximately 20 channels should be required in this example.

The actual frequencies to be used are subject to further negotiation. At the present time, frequencies above 108 MHz but below TV Channel 7 seem mutually acceptable.

[illegible]

[illegible]

[illegible]

[illegible]

of Congress wishes to have this service, the Cable Corporation will provide a special (FM spectrum only - if so desired by the Cable Corporation) connection to his home. Dissemination of any of the Library of Congress recordings to persons not legally qualified to receive them, i.e. not blind or physically handicapped - is prohibited. It is expected that the total number of Telebook users (normal CATV subscribers plus present non-subscribers) will not exceed 0.1% of the population dwelling in residences passed by the cable system, which also constitutes the limits of commitments of the Cable Corporation relative to additional special subscribers for this experiment.

Finally, it should be stated that the Contractor recognizes that the Cable Corporation enterprise is solely dependent on the carriage and delivery of the highest quality entertainment TV signals, and that it is essential that the Contractor experiment not interfere in any way with such service. If any question arises as to the possibility of interference, the Cable Corporation retains the right to suspend any operation in question until cause for the interference is resolved. Likewise, the Cable Corporation recognizes that the Library of Congress, upon granting the funds for the experiment, is making a research investment in the Cable Corporation system, and that obtaining valid results from such an investment depends upon the Cable Corporation providing dependable and continuous service to the experiment participants.

CABLE CORPORATION OF (City) DATE

THE MITRE CORPORATION